THE ENGINEERING AND MINING JOURNAL AND COAL

(Published Every Saturday at 253 Broadway, New York.)

Entered at the Post-Office of New York, N. Y., as Second-Class Mail Matter.

VOL. LXVI. DECEMBER 17. No. 25.

RICHARD P. ROTHWELL, C. E. M. E., Editor.

ROSSITER W. RAYMOND, Ph. D., M. E., Special Contributor.

THE SCIENTIFIC PUBLISHING CO., Publishers.

Subscriptions are PAYABLE IN ADVANCE. For the United States, Mexico and Canada, $5 per annum; all other countries in the Postal Union, $7.

When change of address is desired, both old and new address should be sent.

NOTICE OF DISCONTINUANCE.—The JOURNAL is not discontinued at expiration of subscription, but is sent until an explicit order to stop is received by us. We find that a large majority of our subscribers prefer not to have their subscriptions interrupted, and their files broken in case they fail to remit before expiration. It is therefore assumed, unless notification to discontinue is received, and the amount of back subscription paid to date, that the subscriber wishes no interruption in his eries. PAPERS RETURNED ARE NOT NOTICE OF DISCONTINUANCE.

Main Office: 253 Broadway (P. O. Box 1833), NEW YORK.

Telephone Number, 3,095 Cortlandt.

New York Cable Address—"ROTHWELL." (Use McNeill's or A B C 4th Edition Code.)
London Cable Address—"PULCINETTO." " " " "

Branch Offices: Chicago, Ill., Monadnock Building, Room 737.
Denver, Colo., Boston Building, Room 206.
Salt Lake City, Utah, Walker Bank Building.
San Francisco, Cal., 207 Montgomery Street.

London Eng., Office, 20 Bucklersbury, 366 & 367. E. Walker, Manage

English subscriptions to the JOURNAL may be paid at the London office at the rate of $7 = £1 8s. 9d.; the publications of the Scientific Publishing Company may be bought at the rate of 4s, 2d. to the dollar, net.

CONTENTS.

	Page
Petroleum Production in Russia	721
American Iron and Steel in Germany	721
American Coal in Brazil	721
Railroad Rates to Utah Mines	721
Exit the Ashcroft Process	722
Some Klondike Companies in London	722
European Iron Ore Supplies	723
New Publications	723
Books Received	723
Correspondence	723
Sault Ste. Marie Canal Traffic	724
Conventions of Scientists in New York	724
Mining and Milling Gold Ores in Western Australia . H. C. Hoover	725
Recent Decisions Affecting the Mining Industry	726
*Morris P. Janney	727
Fuel at the Caylloma Mines, Peru . . . . . Bernard Hunt	727
Slate in India	728
*Recent Gold Dredges	728
Cyanide Practice in Utah	730
The St. Michel Electrolytic Chlorate Works . . John B. C. Kershaw	730
*The Jeffrey Electric Locomotive	731
*The Charles Reverberatory Furnace	731
Questions and Answers	732
* Patents Relating to Mining and Metallurgy	732

* Illustrated.

Personal..... 734
Obituary..... 734
Societies and Technical Schools..... 734
Industrial Notes..... 735
Trade Catalogues..... 735
Machinery and Supplies..... 735

Mining News.
United States:
Arizona..... 735
California..... 735
Colorado..... 736
Florida..... 736
Idaho..... 736
Michigan..... 736
Minnesota..... 737
Missouri..... 737
Montana..... 737
New Jersey..... 738
Pennsylvania... 738
South Dakota... 738
Utah..... 738
Washington 739
Wyoming..... 739

Foreign:
Australasia..... 740
Canada..... 740
Mexico..... 740
Newfoundland.. 740

Markets.
Coal:
New York.... 740
Birmingham.. 740
Pittsburg..... 740

Roofing Slate:
Prices of..... 741

Chemicals and Minerals:
New York 741
Valparaiso.... 742

Metals.
Iron:
Pig Iron Production..... 742
Buffalo 742
Birmingham.. 742
Cleveland..... 742
Philadelphia.. 742
Pittsburg..... 743
New York.... 743

Gold and Silver Prices, Statistics, Imports and Exports 743
Foreign Coins 743
Copper..... 744
Tin..... 744
Lead..... 744
Spelter..... 744
Antimony..... 744
Platinum..... 744
Minor Metals. 744
Quicksilver... 744

Assessments.. 738
Dividends..... 738
Meetings..... 738

Mining Stocks.
Market Reviews:
New York.... 744
Boston..... 744
Salt Lake City 744
San Francisco 745
London..... 745
Paris..... 745

Late News.... 745

Stock Quotations
New York.... 736
Philadelphia.. 736
Pittsburg..... 736
Boston..... 736
Baltimore..... 736
Cleveland. . 736
Colo. Springs. 736
Toronto..... 736
Denver..... 737
Helena..... 737
San Francisco 737
Salt Lake City 737
Rossland, B.C. 737
Mexico..... 738
London..... 738
Paris..... 738
Valparaiso.... 738
Shanghai..... 738

Mining Co.'s.
List of..... 739

Current Prices.
Minerals, Chemicals, etc..... 740

Advt. Index.. 17

Advt. Rates... 20

It is probable that for the first time in our history the United States will this year be surpassed by Russia as a producer of petroleum. Reducing the totals to the common standard of metric tons, we produced in 1897 a total of 7,708,236 tons, while the quantity reported for Russia was 6,919,000 tons. For the first half of the present year, however, according to Russian official figures quoted by the "Chemiker Zeitung," the output was 3,993,300 metric tons, which points to a total for the year approximating 8,000,000 tons. The output of the United States for 1898 will not differ greatly from that of 1897; if anything it will be somewhat less, so that we may expect to fall to the second place. The Russian growth is the more remarkable, as production in that country continues practically confined to the small area of the Apsheron Peninsula, and no new fields of importance have been opened.

The imports of American iron and steel into Germany have shown a notable increase this year. According to the official returns, the total imports for the full year 1897 included 20,838 tons of iron and steel in various forms and 11,652 tons of machinery, while for the eight months of the current year to the end of August the totals were 18,024 tons of iron and steel and 16,190 tons of machinery. Thus, while the business in raw material indicates a considerable growth, that in machinery was actually much greater in amount for the eight months than for the whole of last year. Comparing the figures for eight months, the imports of American machinery show an increase of 75 per cent.; and they formed this year 28 per cent. of the total from all countries, against 18 per cent. last year. This growth in trade has been a rapid one, and is causing the German manufacturers much concern.

A consular report just received says that at the recent opening of bids for 120,000 tons of coal for the Central Railroad of Brazil four bids out of eleven submitted were for American coal. The prices given were as a rule lower than those for Welsh coal. They were, for coal dedelivered on wharf at Rio Janeiro, $6.56 a ton for Toms Creek (Virginia) coal; $6.79 for New River; $6.93 for Virginia coal, mine not specified; and $7.06 for Pocahontas. The bids for Cardiff coal varied from $6.99 to $7.79 a ton. All the American bids were thus slightly below the Cardiff, with the exception of the Pocahontas. The contract has not yet been let. The qualtity of the American coal offered has been proved quite equal to that of the Welsh, and as the prices are lower there is an opportunity of opening a new and considerable trade. We believe that the English coal men have heretofore held the Brazilian trade entirely. Apart from the price and quality of our coal we have no special advantage, as the voyage from Norfolk to Rio Janeiro is as long and a little more dangerous than that from Cardiff.

The miners of Utah and Colorado are much stirred up by the action which the railroads have just taken with regard to freight rates on ore and bullion. To Colorado this is of very much less importance than to Utah, since the proportion of ores shipped is much smaller, and that treated at local mills and shipped to the smelting works in the State is very much larger than in the further Western State. In Utah the question is a vital one, however, to many mines, and there is a very strong feeling on this point. The rates now in force, and those which will be charged after January 1st, are as follows, per ton:

	Present.		New rates	
Salt Lake to—	Ore.	Base bullion.	Ore.	Base bullion.
Missouri River points	$9.00	$11.00	$10.00	$13.50
Mississippi River points...	10.50	12.50	11.50	14.50
Chicago	11.50	13.50	12.50	15.50

Taking average distances, the new rate on ore to Missouri River points is about 1 cent per ton-mile, and on base bullion 1¼ cents. The differential between ore and base bullion is also increased; under the present schedule it is $2 per ton, while under the new one it will vary from $2.50 to $3, which does not look like encouragement to local smelting works.

The additional charge will be a serious matter to the Utah silver-lead producers and may result in a diminished output of ores, especially as lead prices are not improving at present. The point which causes the strongest feeling against the railroads is the extent to which rebates are made to favored shippers, who thus obtain an undue advantage over their rivals. This discrimination is really a greater injury to shippers than the higher rates. The latter are a serious matter enough, as a difference of $2, or even $1, a ton in charges may be quite sufficient to convert a small profit in working into a loss. The action of the railroads is a short-sighted one.

EXIT THE ASHCROFT PROCESS.

In our issue of December 10th we referred to the quarrels of the Sulphide Corporation (Ashcroft's Process), Limited, in connection with the annual meeting of the company and the election of a new board of directors. Since that writing we have received the printed report and

accounts of the company for the year ended June 30th, 1898, which contains considerable interesting information. To the shareholders of the company probably the most interesting part is the promise of further dividends from the operation of the Central Mine, at Broken Hill, but to the public at large the most interesting details are those as to the exploitation of the Ashcroft process. The latter are comprised in the reports of Messrs. A. E. Savage, manager of the works; H. H. Schlapp, consulting metallurgist of Melbourne, and August Raht, metallurgist, of New York.

According to Mr. Savage's report the total production of spelter was 125 tons, of which 50 tons were shipped to England. Besides this there are 32 tons of kettle dross and 10 tons of moss zinc still in stock. The principal cause of the difficulty was the formation of "moss zinc." All attempts to smelt the residues from the leaching vats in their wet state proved impracticable, and their treatment had to be deferred until some method of rendering them amenable to profitable smelting could be worked out. The company is still carrying out some experiments bearing upon the recovery of the zinc by purely chemical methods as crude oxide suitable for reduction to spelter.

Mr. H. H. Schlapp, who was well known as a silver-lead smelter in the United States before he went to Australia, where he has held various highly responsible positions, among others with the Broken Hill Proprietary Company, reported, January 4th, 1898, that there were certain serious difficulties with the Ashcroft process, but he had no doubt that improvements could be made until the process could be carried out successfully as far as the technical running goes, although it would no longer be recognizable as the Ashcroft process.

Mr. August Raht, however, comes out flatly with the statement that after inspection of the plant, wherein he noticed a great number of very serious obstacles to final success that had never occurred to him previously, he must condemn the process absolutely, and he recommended the directors to sell out all machinery and supplies that cannot be used possibly in the new process with which experiments are being made.

Incidentally, we may mention that Mr. Ashcroft himself is now engaged in exploiting the patents of James Swinburne for the treatment of this same kind of ore, wherefore it would appear that he, too, had lost faith in his own process. It is not out of place to mention that Mr. James Swinburne was the chemist who reported originally and favorably upon the Ashcroft process in behalf of the Exploration Company. Mr. Swinburne is an expert chemist and electrician, we are informed, but we are unaware that he had any large practical experience before reporting upon the Ashcroft process, or any special knowledge of the problems involved in the treatment of these ores. We think it unlikely that we shall hear any more of the Ashcroft process as a metallurgical possibility.

SOME KLONDIKE COMPANIES IN LONDON.

Two Klondike companies which have recently been wound up in London—the Klondike Hydraulic, Limited, and the Klondike Bonanza, Limited—are worth notice as excellent speciments of misrepresentation (to say the least) on the part of the vendors and lightheartedness on the part of the London directors. The Klondike Hydraulic, Limited, was floated in London in February last, and details, with the opinion of our London correspondent, were given in the "Engineering and Mining Journal," February 20th, 1898. It was brought out by promoters who formed part of the circle of the late Col. North, and its object was to acquire Willow claims Nos. 1, 2 and 3, on Bonanza Creek, Alaska, not in the Klondike District at all. The vendor was George William Rumble, who gave specific accounts of how he had worked the properties, how there was a large store of gold already won, and how the weekly output was 500 ounces. The directors told the public they had no confirmation of Mr. Rumble's statements, and they did not intend to pay him any cash or shares until such information came to hand. It appears that after the formation of the company Mr. Rumble made pressing requests for the £36,000 in cash, but the directors wisely refused. Eventually one of the directors went to America and dispatched an engineer to the spot to make inquiries. He took £10,000 in cash to pay the vendor, if all was in order. The result, however, proved that no such claims existed, that no washing for gold had ever been made anywhere near, and that the certificates of ownership were forgeries. Of course, the deal was at once off, but not before a few thousand pounds had been spent in directors' and experts' fees and traveling expenses, etc. However, the company is to be wound up, and probably the shareholders will get 90 per cent. of their capital back, which is more than most Klondike shareholders will get.

The other case is the Klondike Bonanza, Limited. This company was formed early in January last, to acquire certain claims on Bonanza Creek and Last Chance Creek, both near Dawson City, from a certain Mr. A. E. Ironmonger Sola, and at the time it was referred to in our London letter, published in our issue of January 22d last; it was promoted by people forming part of the backers of the London & British Columbia Gold-fields, Limited, in conjunction with another group of promoters. As in the case of the Klondike Hydraulic, the directors took no responsibility for Mr. Sola's statements and deferred payment to him until corroboration was received. Immediately after the execution of his contract, Mr. Sola disappeared from London for a few weeks, ostensibly on private business. In reality, however, he paid a surreptitious visit to New York and negotiated a loan with a firm of bankers on the strength of the contract. By an extraordinary coincidence another man shortly afterward approached the same bankers for a loan and offered the title deeds of the same properties as security. Inquiries were at once set on foot and it was discovered that Mr. Sola never owned the properties, though at one time he had held an option. He was therefore arrested for fraud, and the company kept its money, though naturally a considerable amount had been expended in the ordinary course of things. The moral of all this is that companies should investigate properties before selling them to the public. They should not say, "Here is a man who says he has something to sell; put down your money, but we disclaim any responsibility and do not vouch for his statements." In such cases the directors have not even given the company the benefit of their reputation as honest and able men, and as this is all that most directors bring to a company in exchange for their fees, the whole transaction looks as if they were getting something for nothing.

EUROPEAN IRON ORE SUPPLIES.

The European iron-masters have recently become more deeply interested than ever in the question of iron ore supplies, as is natural in a period of active trade, and discussions on this subject are going on in their representative associations and periodicals. Many of the deposits which have been long worked are becoming exhausted, and it is now, or will be soon, necessary to look elsewhere for their raw materials. In Great Britain, where the furnaces have been for years large importers of ores, this is especially the case.

At the present time there are four large and important deposits which are looked to for the future, though exploration may in time develop others. Most European countries, with the exception of Russia, have been pretty thoroughly prospected, however, and expectations of new discoveries are only moderate.

The Spanish iron ore beds have been worked in a small way for centuries, but during recent years have been the main reliance of the British furnaces for high grade Bessemer ores. The Bilbao mines are estimated to have yielded over 100,000,000 tons, and are gradually becoming more difficult and expensive to work, as the larger ore bodies are becoming exhausted and the demand increases. These deposits and those of Somorrostro have been valued because of their freedom from phosphorus and other impurities, which makes them especially valuable for steel pig. It is due largely to their quality that the English steel makers have been able to adhere so generally to the acid processes, both in converter and open-hearth steel. Unless new discoveries, which are not now expected, are made, it is thought by good authorities that not more than ten years' supplies can be looked for, at the present rate of export. Moreover, the cost of mining is increasing as the beds are worked out, and it is evident that the Spanish iron mines are well past their best days.

Of more future importance than the Spanish mines are those of Northern Sweden, the development of which is comparatively recent. At the Grangesberg and in the districts of Gellivara and Kurunavaara, in Swedish Lapland, there are very large deposits of iron ore opened—in the last-named districts it is estimated that over 200,000,000 tons are available—and they are so situated that they can be mined easily and the ores can be delivered on deep water with a very short railroad haul. These ores average at least 50 per cent. iron, some of them running up to 70 per cent. Their great drawback is the high percentage of phosphorus, which unfits them for the Bessemer process. Some promising experiments have been made in the magnetic concentration of these ores, and in freeing them from a part of their phosphorus. Most British authorities are inclined to look on Sweden as their chief future reliance for ore supply.

The ore deposit of the Erzberg, in Styria, though it is known to have been worked since Roman times, is still apparently far from exhaustion, and promises to be an important source of supply for the Austrian and a small section of the German iron industry for a long time to come. These ores run from 40 to 50 per cent. iron and are low in phosphorus. They are cheaply mined, but expensive railroad transportation limits their availability to a comparatively small radius.

The oolitic or minette ores of Luxemburg and Elsass constitute a very important reserve for the German iron industry; and to them are to be added the deposit of similar ores lately discovered at Briey, in French territory. These ores are of a low grade, running usually from 35 to 40 per cent. iron, and they carry a high percentage of phosphorus.

It is their use which has determined the extensive employment of the basic process by the German steel makers. Over five-sixths of the steel made in Germany is basic steel, and this proportion is increasing rather than diminishing. Like the Erzberg ores, the minette ores are not available for export, and their use is limited to Germany, Belgium and a part of France.

Russia has undoubtedly very large iron ore reserves, and is the European country where the greatest future developments may be expected. The mines of the Oural region are the best known and the most extensively worked up to the present time. The Krivoi-Rog deposit in Southern Russia is a very large one, and is being actively developed. In Siberia there are very large deposits of iron ores which have hardly been touched as yet. There are almost unlimited supplies which may be drawn upon in the future as the country is opened up and transportation facilities improved. The Russian iron ores are for the most part located far inland, and are not in any case available for export, so that they cannot enter into any future calculations for Western Europe.

Some minor supplies have been drawn from Elba, from some of the Greek islands and from Algeria, but these are all comparatively limited thus far and are apparently capable of only a small development.

British iron-masters have seriously discussed the question of importing ores from India, but the distance seems to be a bar in that case. The importation of ores from our own Lake Superior region has also been discussed, but the cost of transportation to the Atlantic seaboard is at present too high to make this probable on any large scale. A much more promising field is found in the island of Newfoundland, whose future capabilities as an iron ore producer are only just beginning to be understood. Attention will doubtless be turned to them before long, as the island is now being opened up by enterprising men, who are interested in exploiting its resources.

The present discussions are only bringing out more plainly the fact that no European country is able to compete with the United States in the cheapness and abundance of its raw materials; and our leadership in the iron trade will become more pronounced with each year that passes. Russia and China are possibilities of the future; but it will take many years for their full development to come.

NEW PUBLICATIONS.

"Annual Report of the Department of Mines and Agriculture, New South Wales, for the year 1897." Pages, 215; with numerous maps and diagrams.

This is an admirable example of the very serviceable series of reports to which it belongs. Like most official documents, it has the disadvantage of tardy publication, but it has evidently been prepared with a view to thoroughness. It contains the report of the Under Secretary, that of the Lease Board, the Prospecting Board and the Geological Survey; sections on Mining Survey, Charting, the School of Mines, Metallurgical Works, Inspection, Diamond Drills, Mineral Products (taken up individually), and a number of reports of inspectors and geologists. The illustrations are liberal.

We shall have occasion to notice more fully the mineral production of New South Wales, and need here only state that the total valuation of the output for 1897 was £4,685,273, a net increase of £206,964 over that for 1896, the principal gain being in copper and the largest decrease in silver-lead.

"Practical Handbook for the Working Miner and Prospector and the Mining Investor." By John A. Miller. London, E. & F. N. Spon; New York, 1898, Spon & Chamberlain. Pages, 234; illustrated. Price, $3.

This is one of a rather numerous class of books, of which it must be honestly said that none is satisfactory. It is impossible to cover the whole field of practical mining (to say nothing of mineralogy, lithology, economic geology and prospecting,) in a single volume, superadding an exposition of the financial side of the industry; but because others have failed in the attempt the field seems inviting to the present author.

Mr. Miller is nothing if not "practical." He is not alone in a prejudice which sets strongly against all "book knowledge" and systematic training, and which not infrequently degenerates into cant. The tendency is so general that one may see trade signs along the streets reading, "John Doe, Practical Hatter," "Richard Roe, Practical Plumber," etc.—as though there would be much room for a theoretical hatter or a theoretical plumber. The author is at pains to subscribe himself, on the title page, as "a practical working miner," and it is from this point of view only that it is fair to criticize his book; yet he is not above excursions into geologic theory at times. Now, science is simply knowledge, whether got in the schools or outside; there is nothing occult about it, nothing beyond the plain lessons of experience and deduction; and it is hard to understand why it should be considered a detriment. Of course, the youthful graduate of a professional school is sometimes afflicted with the "big head" and is tempted to be a little fresh; but all this is soon worn off by dint of hard knocks when he comes to real work. It is well recognized that considerable experience is needed, and a certain degree of maturity and knowledge of men and affairs, before the young engineer is fitted to assume the responsibility of managing an important mine or works, but he becomes educated up to this stage while serving in subordinate capacities. There are few opportunities nowadays for a theoretical engineer, if there be such a person.

This book is divided into two main parts: (1) "The Practical Handbook for the Working Miner and Prospector" and (2) "The Mining Investor's Handbook." Without commenting upon any of the eccentricities of geologic speculation (Part I., Book iii.), a glance at the "practical" directions will give an inkling as to their reliability. One notes, for instance, the grave precept (p. 59) that "it will not be profitable to make the size [of a shaft] less than 3 ft. 6 in. long by 2 ft. wide." Every miner will concur in that—the more heartily if he is of full weight and works with something bigger than a teaspoon. But every miner will view with wonder the diagrams of drift timbering (pp. 45 and 46), with the vertical posts resting upon neither sill nor foot pieces, but with the frames cased in by a complicated wealth of plank lagging, in three thicknesses, and a domed space above the caps neatly packed in with rocks. It is not all so original as these haphazard examples might imply, however; much is really sound, and has the merit of being plainly expressed.

The second part, that relating to mine investment, is better. The author very properly condemns the top heavy system of financing mines, with 75 per cent. of the cash capital for the promoters and 25 per cent. for development, and he shows the absurdity as well as the injustice of the present British custom of floating mining companies, by which both the original owners of mining property and the share subscribers are so badly squeezed.

Throughout the book, it should be remarked, the author has in mind Australasian practice, and more particularly that of New Zealand.

BOOKS RECEIVED.

In sending books for notice, will publishers, for their own sake and for that of book buyers, give the retail price? These notices do not supercede review on another page of the Journal.

"Rossland, of British Columbia, in 1898." Published for the Board of Trade of the City of Rossland. Pages, 36; illustrated.

"The Railway Map of South Africa, 1899." London, E. C., England; Published by "South Africa." Price in New York, 35c.

"Western Australia: Statistical Register for the Year 1897. Part IV. —Interchange." Perth, W. A.; Government Printer. Pages, 193.

"Annual Report of the Chief of Engineers, United States Army, 1898." Washington, D. C.; Government Printing Office. Pages, 587.

"Review of the Mineral Production in India for 1897." David Hooper, Government Reporter. Calcutta, India; Government Printing Offices. Pages, 114.

"List of Lights and Fog Signals on the Atlantic and Gulf Coasts of the United States." Corrected to June 30th, 1898. Washington, D. C.; Government Printing Office. Pages, 181; with map and illustrations.

"Census of the Commonwealth of Massachusetts, 1895. Part 2, Volume III. Population and Social Statistics." Prepared under the direction of Horace G. Wadlin, Chief of the Bureau of Statistics of Labor. Boston, Mass, 1898; State Printers. Pages, 100.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.

Letters should be addressed to the MANAGING EDITOR.

We do not hold ourselves responsible for the opinions expressed by correspondents.

The Salem, Virginia, Mineral Collection.

Sir: With the election, a few days ago, of Professor W. A. Smith, of Roanake College, Salem, Va., director pro tem., and Emlen Hare Miller secretary pro tem., the work of this permanent mineral collection, recently established in connection with the coming mining celebration at Salem, has begun. It having been decided that all specimens of minerals, in order to have a business value for the purposes of the collection, must be taken from the ground by direction of an expert, representing the general committee. A number of prospectors, as applications are received from competent men, are being employed and sent out. It is proposed to cover in this way, if practicable, at least 30 counties of Virginia. Specimens are now in stock from seven counties. The variety of minerals that will be represented in the collection a few months hence is indicated by the following partial list of those which have already been sampled: Brown hematite ore, magnetic ore, magnanese, red hematite, zinc, copper, specular iron ore, fire clay, umber, ocher, soapstone, kaolin and asbestos. Arsenic, graphite, glass sand, plaster, engraving stone, barytes, marble and granite are also known to exist in the State in considerable quantities, although not yet represented in the collection. It is proposed that the great majority of the specimens shall have labels attached to them, stating the thickness and length of the deposit from which they were taken, the distance of the deposit from the nearest railroad siding, the character of the road leading to that point, etc. Chemical analyses will be made of specimens as they come in, and a reader interested in any mineral mentioned may learn by correspondence with the secretary the quantity of the component parts.

M. C.

Salem, Va., Dec. 10, 1898.

Chlorination at the Mount Morgan Mine, Queensland.

Sir: The Mount Morgan Mine, which is well known all over the mining world, is certainly a great mine, with at least 50 years' life ahead of it. As the treatment of the ore is peculiar, a brief account will be interesting to your readers.

At this mine all the ore is chlorinated, and the surface ½-oz. ore that only requires heating to redness in a revolving furnace is treated at the rate of 12,000 tons per month at a cost of about $2.50. The chlorination is effected by leaching the ore with chlorine water, a method that has proved the cheapest and most effective. The vats are of concrete 60 ft. by 12 ft. by 5 ft. The lower levels contain pyrites and are very rich in gold. For some time it was a mystery to me why Mount Morgan with

clean iron pyrites containing 1 or 2 per cent. of copper continued gold bearing, as in every other case in Queensland unless the iron pyrites was accompanied by a little galena, zinc-blende and arsenical pyrites the gold invariably disappeared. After some time it was discovered tha the Mount Morgan pyrites contained telluride of gold, and it is the occurrence of this that keeps up the value. In some parts of the mine there is any quantity of pyrites with no tellurium and also no payable gold.

The precipitation is very good, and the adoption of any precipitation method that necessitated keeping liquor in vats for a time would be inconvenient and almost unworkable on the Mount on account of the enormous volume. As to charcoal, you Americans I imagine failed with it for the same reason that some Australians did also—it was not used fine enough. The Mount crushes the charcoal and all that passes 20 mesh and remains on 30 mesh is called "coarse," that which passes 30 and remains on 40 is called "fine;" all that passes 40 is thrown out, and fine and coarse are washed with water to free them from any impalpable dust.

The filters can be any size, but it is well not to have the charcoal column less than 18 in. in depth. The small filters contain 12 cu. ft. of charcoal, measured loose, 4 cu. ft. of coarse and 8 cu ft. of fine; 3 cu. ft. of coarse is placed on the bottom, and the 8 cu. ft. of fine above this; on top the other cubic feet of coarse, with a heavy perforated sheet of lead to keep it down. The charcoal is stamped in hard with the foot, and especially round the circumference of the filter, to prevent the gold liquor finding its way between the charcoal and the walls.

For 7 months the liquor running away from these filters assayed in one mill 0.76 gr. per ton, and in the other 1.89 grs. per ton. Before passing through the charcoal the liquor must be warm. After passing the charcoal all liquors are run through a concrete tank with a bed of sawdust a foot deep and covered with lead plates like the filters. Every 6 months or so this was burned and from 15 to 20 cwt. of ferric-oxide ash obtained assaying 200 to 300 oz. gold per ton, which was sold to the smelters.

At the Mount Morgan formerly they amalgamated the ash from the charcoal filters, which only ran 5 to 10 per cent. of gold on account of the crystallization of $Ca\ S\ O_4$ from the bleaching powder and $H_2\ S\ O_4$ used in the barrels. After the introduction of the chlorine-water vat process, there was, of course, no $Ca\ S\ O_4$ in the liquor, and the ash became very rich, 30 per cent. Au. On amalgamating this formed rich slimes, going as high as 1,200 oz. to the ton, which were sold to the smelters.

The loss must have been high, and moreover a company likes to see as much gold as possible produced in its own works without having to sell too much as by-products. I started smelting the ash in crucibles, which they had done before, while I planned out a furnace. The amount of dust per month was about 30 cwt., 60 cwt. with fluxes, so smelting in crucibles was very laborious, and the slags were always full of gold beads which had to be amalgamated. I designed a small reverberatory like an ordinary steel furnace, with a cast-iron pan to hold the brick hearth. The pan was supported on four screw standards which could be moved up and down and the whole hearth withdrawn from the furnace when necessary. The pan was lined with fire-brick. I tried smelting in a sand-hearth, but gave it up and stuck to the simple fire-brick hearth. The next question was how to prevent the fluxed dust (1 $Na_2\ SO_3$; 1 borax; 2 dust) being swept up the flue, and used soda ash instead of bicarbonate of soda. The gold dust, soda ash and borax were mixed on a concrete floor dry and then moistened with water. I argued that the soda ash, being anhydrous, would combine with the water, and the crystal carbonate thus formed would more or less bind the mixture together, and on charging into the furnace the crystallized $Na_2\ S\ O_3$ would at once melt in its own water of crystallization, and form a hard cake from which no dust could be taken by the draft. This succeeded beyond my expectations. After six months' work with the furnace, during which time 75,000 oz. gold had been melted, I tore down 25 ft. of the flue and crushed it in a battery, and obtained only 35 oz. gold, most of which came from the first 8 ft. of the flue.

The fire-brick hearth of course allowed gold to soak in, as the joints were soon eaten out by the alkaline fluxes. It was seldom we wanted all the gold produced during a month, and usually let the hearth alone for three or four months, then lowered it down, tore the bricks out of the cast-iron pan, picked out the large pieces of gold and sent the rest to an old 5-stamp mill and got the smaller beads. A clean-up like this would generally produce 2,000 oz. of gold. This does not sound very well, but if wanted the hearth could have been torn out every month and the gold obtained. The work was easy, and even if we had to put in a new hearth every month, paid better than destroying a lot of expensive graphite crucibles. When the charge melted there was a layer of 6 in. of slag above the gold, and it took a long time to get this hot enough to melt the gold as well. We found it quite unnecessary. After four or five hours the gold became semi-molten, and settled down out of the slag in irregular lumps on the hearth; then we tapped out the slag, allowing it to run into a large mould capable of holding 9,000 oz. of gold to catch any gold that might come out, and thence into slag pots. This slag assayed about 20 to 30 oz. only per ton, and contained no amalgamated gold. The furnace would be then plugged again and fired heavily for an hour and a half, when the whole of the gold was brought to fusion and could be tapped out into a mold with no more trouble than a bar of copper. My largest tap was 9,000 oz. The big mold was, of course, divided into pieces, which were remelted into easily handled bars. From its convenience at Mount Morgan any large cyanide plant having tons of precipitate per month to work up might find it also convenient. T.

Aldershot, Queensland, Oct. 15, 1898.

COPPER ORE IN NEWFOUNDLAND.—Exports from Newfoundland for the year ending June 30th, 1898, included 56,715 tons copper ore, of which 38,915 tons went to Great Britain and 17,801 tons to the United States. There was also exported to Great Britain 9,616 tons of copper regulus. Several new deposits of copper ore have recently been made.

SAULT STE. MARIE CANAL TRAFFIC.

The traffic through the Sault Ste. Marie Canals, up to December 1, when the season was nearly closed, is the largest on record. The number of vessels passing the canals was 17,450, and the total freight carried was 20,667,333 short tons; which compares with 17,785,452 tons in 1897, and 16,097,880 tons in 1896. Of the total this year 4,383,225 tons, or 21 per cent., was west-bound, and 16,284,108 tons, or 79 per cent., east-bound.

The mineral freight passing through the canals was as follows, in short tons:

	1897.	1898.	Increase.
Anthracite coal	531,183	535,043	3,860
Bituminous coal	2,400,533	3,198,079	797,546
Copper	118,670	121,801	3,131
Iron ore	10,569,965	11,593,286	1,023,321

A few belated steamers left Duluth as late as December 7th, and succeeded in getting safely through the locks at the Sault, but most of them were caught later in the ice in Lake St. Clair or at the western end of Lake Erie. Navigation at the Sault was closed by December 10th.

CONVENTIONS OF SCIENTISTS IN NEW YORK.

Eleven scientific associations have appointed their winter meetings to be held in New York during Christmas week this year. The assemblies which will especially interest the readers of the "Engineering and Mining Journal" are those of the American Chemical Society and the Geological Society of America. The chemists will open their sessions Tuesday morning, December 27th, in the assembly hall of the Chemists' Club House, No. 108 West 55th Street, with the hearing of addresses and the reading and discussion of papers. Tuesday afternoon will be devoted to visiting the works of the New Jersey Zinc Company, at Newark. Wednesday the sessions will be held in Havemeyer Hall of Columbia University.

The geologists will begin their meeting on Wednesday, December 28th, and will hold their sessions in the geological lecture room of Schermerhorn Hall of Columbia University. They have twenty-nine papers outlined in their preliminary programme in addition to the presidential address, and the published abstracts indicate that the sessions, which will probably last three days, will be as full as usual of scientific interest. The president of the Chemical Society is Professor Charles E. Munroe; while Professor J. J. Stevenson is the head of the Geological Society.

MINERAL EXPORTS FROM NEWFOUNDLAND.—Exports of minerals (other than copper ore) from Newfoundland for the year ending June 30th, 1898, were 15,724 tons of iron pyrites; 125 tons of arsenical pyrites, and 1,500 tons of manganese ore, all to the United States. There were also exported 44,627 tons of iron ore, chiefly to Nova Scotia.

COAL-TAR FOR FIRING BOILERS.—The "Deutsche Kohlen Zeitung" describes a lignite distilling plant, in the pipes of which the tar and water are condensed, the former being utilized for firing boilers in the following manner: On the boiler setting is mounted a cylindrical receptacle which, for effecting the separation between the tar and water, is heated by a worm traversed by the exhaust steam of the feed pump. The water is drawn off at the bottom, and the tar is collected in a receiver at a higher level than the boiler, descending by a pipe, through another coated with fireclay, to the furnace, where it burns with a short flame of dazzling whiteness without giving off smoke. A boiler fired in this manner is said to have double the evaporating power that it would have if fired by producer gas; and the products of combustion, which contain from 15 to 18 per cent. of carbonic acid, reach the chimney at a temperature of 220° C.

LIGHTNING IN A MINE SHAFT.—In the "Annales des Mines (volume II., 1897, page 910), E. Fineuse says that at the Abhooz Colliery, near Haveny, on July 1st, 1897, a flash of lightning struck the iron pit-head only 16 metres high, in preference to three neighboring chimneys from 25 to 40 m. Part of the electric current went down the winding shaft, which is tubbed with cast-iron rings and contains the pipes from the underground pumping-engine; and at the level of 210 m. it caused an explosion, without serious consequences, in the pumping engine-house, after which it became dispersed in the sump, at a depth of 400 m. The other portion of the current, which remained on the surface, passed along the wires for the electric bells and telephones, breaking and burning these appliances, and also throwing down the underground manager, who was near the mouth of the shaft, as well as four men engaged on the screens.

SURFACE CAVING IN ENGLAND.—The London "Engineer" describes an alarming subsidence of land which occurred recently at Northwich, England. Without the slightest warning, the London main road, which, owing to the treacherous character of this land, due to the salt mining, had been built on timber, began to sink, and within an hour it was impassable. The road was fast settling, and the buildings, fully 4 ft. out of the perpendicular, were kept from collapsing only by their bolts and composite frames. The area of depression extended 120 ft., and a hole 9 ft. deep appeared and was soon filled with water. The road had to be barricaded for a considerable distance, and this led to a complete block of vehicular traffic, the alternative route to Chester, over the bridge that crosses the Weaver, having been stopped owing to the works which are being carried on in connection with that river. With all speed the town bridge, in process of demolition, was reopened, and another temporary road was formed. The water and gas pipes and the electric cable were dislocated, and the utter collapse of the buildings affected seemed to be only a question of time. The subsidence is regarded as one of the most remarkable yet experienced in the salt district.

MINING AND MILLING GOLD ORES IN WESTERN AUSTRALIA

Written for the Engineering and Mining Journal by H. C. Hoover.*

The main gold-field of Western Australia covers an area of about 800 miles north and south by 500 miles east and west, lying at the nearest point less than 100 miles from the ceast. This area is a phenomenally arid desert, covered with the usual central Australian "bush." That portion lying to the north of the gold-field is as yet of minor importance and unfamiliar to the writer.

Of 580 mining companies promoted in this field careful investigation will not show more than 18 which may be termed large mines, but these are mines of which any gold-field might be proud. Eight or nine exist at Kalgoorlie and the others are scattered over a wide area. Besides these leading mines there is a multitude of small ones, many of which would repay individual effort, and from which there may be developed some which will stand the average market capitalization; and it must be remembered that the country possesses vast areas still unprospected.

The 18 mines referred to produced up to June, 1898, a total of 642,284 oz. gold from 295,096 tons of ore. The average value of the ore has therefore been 2.15 oz. per ton, to which may be safely added an average of 1 oz. lost in the tailings, for few mines had during the period instituted tailings treatment. These mines have an aggregate market value of over $62,500,000. It may be here noted that the future grade of the ore will not be so high because all these mines possess quantities of low grade ore and with the era of large crushings on the wane, more capable handling may be expected. It is easier to review than forecast, but the costs of the past years, even were they available, would be but little indication of what they will be four years hence, for it is not the costs during the initiatory stage of a gold-field that are of value in considering investments, but the costs under routine work. Small inefficient equipment, refractory ores, scarcity of water and timber, expensive transportation, inefficiency of labor, severe conditions of life and consequent high wages have all accumulated to place West Australian working costs in a most unenviable light in comparison with other countries. No other lode mining country in the world presents such an array of severe conditions which must be struggled against to do cheap mining. It will become evident from the conditions under which West Australian mining must be conducted that working costs will never approach those of the Rand and much less of most localities in the United States. It is not proposed to deal with the small mines in this article, since their costs will follow more or less those of the larger ones.

The great factor of working costs—tonnage producible—is yet difficult to forecast. There are on the fields 1,787 stamps distributed in 186 mills, or less than an average of 10 stamps to a plant. The country is new, the mines but partially developed, and not one of the large mines possesses an equipment commensurate with its capacity.

The 18 leading mines could, to present appearances, within 12 months' development produce from 150 to 600 tons daily. The following plants are in course of erection or design, and give some idea of capacity: Associated, 600 tons daily; Lake View Consols, 400 tons daily; Hannans Brownhill, 250 tons daily; Ivanhoe, 300 tons daily, and Sons of Gwalia, 300 tons daily. Several others are either in contemplation or awaiting a lead in metallurgical practice. The highest daily tonnage at present is Lake View Consols, 200 tons. The present daily average of these 18 mines is 80 tons.

The mines at Kalgoorlie are impregnations of basic rocks, and due to this there is an enormous proportion of slimes, which, together with the variety of the telluride minerals, presents an ore of great complexity and costly of treatment. The outside mines, with few exceptions, are normal quartz-filled fissure veins and are amenable to plate amalgamation and cyanidation. It seems definitely settled that Kalgoorlie treatment will involve three main principles: Dry crushing, roasting and cyanidation. All plants in construction are mechanical variations upon this basis, yet there are many difficulties to be overcome, the separation and treatment of sufficient slimes to give a leachable product and the securing of the gold too coarse for cyanidation being two leading ones.

There is no surface water on the gold-fields, and it is secured entirely from subterranean sources. Most of this water contains a variable percentage of salts up to the saturation point, but in that portion of the field east of Cue and north of Menzies fresh water is met with occasionally, not, however, in large enough quantities to permit of any relaxation of efforts toward economy. There is no deep seated water, and the zone of surface decomposition of the rocks acts as a reservoir for such rain as falls—about 4 in. annually; below the line of oxidation water rapidly decreases until the workings become almost dry. In localities where mining is much congested, as at Kalgoorlie, and this reservoir is heavily drained a diminution of water may be expected. Salt water for domestic and steam purposes must be distilled and the cost of such distillation varies from 2c. to 6c. per gallon.

But few good mines possess enough water for their own uses, and salt water purchased costs from 75c. to $7.50 per 1,000 gals., varying with the locality. About 400 gals. per ton of ore treated is considered the average mill, steam and domestic loss by careful conservation, or a cost of from 25c. to $3 per ton of ore. When tailings and slimes treatment are added a greater percentage of water is saved; in this case only about 250 gals. per ton are lost. The salt water is detrimental to amalgamation and cyanidation, and, moreover, the devices to which it is necessary to resort for its conservation represent a large additional cost to equipment and a constant cost for labor, the amount depending on what proportion of water it is advisable to lose.

The maximum cost necessitated by scarcity of water is experienced in Menzies, where at one mine it amounts to $3 per ton of ore, and this does not include the loss of gold in treatment due to the water, containing from 15 to 32 per cent. of salt.

A solution of the problem is being attempted by the Government in the construction of a pipe line 400 miles long from the Darling Ranges, at a cost of $15,000,000, from which it is proposed to supply Kalgoorlie and Coolgardie with 5,000,000 gals. daily of fresh water at a cost of about 60c. per 1,000 gals. An auxiliary supply may be obtained by the construction of reservoirs on the Fields to catch the torrential rains, but this cannot be depended upon, nor does the country offer topographical features for any considerable storage.

Although it is a country of unparalleled democracy, it sometimes seems to the manager that the sole object of Government is to hamper him in his relation to his laborers. It is not the high wages, however, of which West Australia managers complain most, but the inefficiency of the men. A careful comparative record shows that they accomplish about two-thirds the amount of work of a Californian miner, and only about 40 per cent. more than the Kaffirs of the Rand. Single-hand work is used in but few mines, those managed by Americans being almost the only ones. The men work 47 hours weekly and receive $15 to $22.50 and water free. The labor has greatly improved during the last two years, owing to the influx of more skilled men from the eastern Australian colonies, and there is reason to hope for further improvement. What the solution may be is uncertain; in some mines Italians have been tried and found to accomplish about one-half more work, but they possess certain disqualifications. The high freight and absolute unproductiveness of the country makes living high, and it is not therefore so much in reduction of wages that reforms must come, but in increased efficiency of the labor.

Suitable timber for mine work and surface construction is very scarce in Western Australia, and although jarrah and karri occur plentifully along the coast, these are as a rule unable to compete with pine and fir imported from the United States. The native timbers are brittle, double the weight of pine, shrink greatly, and are very difficult to work. Sawn woods, either native or foreign, along the railway, cost from $3 to $3.75 per 100 ft., board measure. In the mulga bush, upon which many mines away from the railways have to depend, sticks 8 ft. long and 6 in. in diameter are very difficult to find, and cost about 6c. per running foot. In the southern portion of the fields eucalyptus may be secured, but costs about 12c. per running foot for logs 10 in. in diameter.

The railways are owned by the Government, and from an American standpoint freights are very high, but the roads, like the mines, are run under severe conditions. Freight on machinery to Kalgoorlie is 8.6c. per ton-mile, the distance being 390 miles from the coast. The mines outside of the railroad points are greatly scattered, and transportation is conducted by wagon and on camels. By the former it averages about 24c. per ton-mile, and for such goods as the latter can carry, about half this amount. Since some important mines are as much as 200 miles from the railroad, these freights amount to an enormous sum annually, directly and indirectly, adding from 10 to 20 per cent. to the working costs. A 60-stamp mill and corresponding mine equipment would cost for transportation 100 miles beyond a railroad terminus about $75,000.

Fuel is now secured from the abundant bush over the fields, and consists of varieties of eucalypti and mulga. The latter is the better quality and has a steam efficiency about equal to oak. This wood costs from $5 to $7.50 per cord, varying with the locality. It has been largely cut off around the mining centers, and it is only through railway extension that the supply can be maintained.

It is an open question whether coal is not more economical at Kalgoorlie at present, and if a railway were constructed to Esperance Bay—a distance of 200 miles from Kalgoorlie—Australian coal could be laid down much cheaper than wood.

There is a tariff duty on some mining requisites, but not a high one; the cost of transportation, however, brings up the price of supplies to a high figure. The following table shows the cost of ordinary supplies at Kalgoorlie in June, 1898, comparisons being made with prices on the Witwatersrand at the end of 1897:

	Rand.	Kalgoorlie.
Cement, barrel	$11.04	$5.64
Galvanized iron, sq. ft.	0.09	0.09
Candles, 25-lb. box	2.70	2.74
Dynamite, case	20.40	16.80
Blasting gelatine, case	22.92	20.40
Detonators, box	0.62	0.96
Fuse, coil	0.10	0.17
Shovels, each	0.72	0.68
Hammers, lb.	0.09	0.04
Drill steel, lb.	0.09	0.05
Rails, ton	64.80	57.60
Bar iron, lb.	0.04	0.02
Quicksilver, flask	45.60	41.40

The original mining laws of Western Australia were compiled on the basis of the Queensland laws, but they have been amended by the acts of 1892 and 1895, and further alterations are pending before the present Parliament. Any person holding a miner's right, which costs $2.50 annually, and is issued to all except Asiatics and African aliens, may enter, locate and prospect on Crown lands. A prospector may locate a claim (or any number of claims up to eight) of 24 acres or less in the form of a rectangle, unless pre-existing boundaries interfere. He is then entitled to all minerals (not alluvial) within his boundaries, and in depth within the limit of vertical planes through his boundaries. Within 14 days he must apply for a lease, and within 30 days after approval by the warden must employ one man for every six acres thereof constantly during the entire year, unless exemption be granted by the warden upon special plea of lack of capital, etc. No further title than leasehold may be secured, and the lack of three days' non-employment may render any lease liable to forfeiture. An annual rental of $5 per acre is required, together with various other minor restrictions. Previous to 1897 the labor requirements demanded the constant employment of one man for every three acres.

It is a matter of serious consideration whether this forced development of mining ground has not greatly injured the country. At the outset a large amount of foreign capital poured in, and owing to the conditions imposed it was impossible to develop leases in the most economical way. While it gave a stimulus to development and was de-

*I am indebted to many gentlemen for data herein given, principal among them being Mr. H. C. Callahan, Mr. Edward Skewes and Mr. E. W. Hine.—H. C. H

signed primarily to benefit the workingman by compelling his employment, it defeats this purpose by preventing continued prospecting by individuals of limited means. Another weakness of the law lies in the dual title of alluvial and reefing miners; but these and other questions do not directly affect the matter of working costs.

The aim of the Government is chiefly to foster the industry, which is, in fact, the real backbone of the colony; but the control of the Government by the people of the coast keeps their particular interests in sight. The tariff on food stuffs, high railway freights, and refusal to allow construction of the most economical sea-board outlet to the fields —Esperance Bay—are the main complaints of the miners. Yet the Government must be credited with its rapid extension of the railroads, telegraph lines, public conveniences over the fields, and the freedom of the industry from direct taxation, etc., even if that already done does focus toward Perth.

The direction from which changes should come in order to lower working costs are from decrease in duties on food stuffs and supplies; decrease in freights; further extension of railroads; removal of restrictions on Asiatic labor; decrease in labor requirements to hold title; and many minor directions. It is safe to say that if these questions were so handled as to result in the maximum good, the working costs on the gold-fields could be increased by 20 per cent.

Many differences exist among different mines as to the distribution of expenditures; and this, together with the reluctance of many managers to give their figures, renders the determination of past costs very difficult. The object is rather to forecast the ultimate costs, and the plan pursued has been to take the average cost of conducting any single operation in a number of mines. Many of the leading mines have come down to a business basis; but aside from these, the investigator is confronted everywhere with the share-market in the form of misrepresented tonnages, which, of course, vitiated all estimates. The data used are largely from the Lake View Consols, Great Boulder Proprietary, Great Boulder Main Reef, Hannan's Brownhill, Sons of Gwalia and East Murchison United.

The ground below the line of oxidation (from 100 to 200 ft.) is usually very hard, and in it the cost of driving and cross-cutting by hand work varies from $10 to $30 per ft. Shaft sinking at Kalgoorlie varies from $30 to $60 per ft., including timber. Machine work costs even a greater percentage over hand work than in other regions, because of the difficulty in securing experienced men.

Owing to the width of the lodes (from 6 to 30 ft.), the tonnage developed per foot of opening is very great. If we include in development the cost of winzes and raises, the general average has been about $1.08 per ton of ore developed. This figure, however, must be taken with a grain of salt, since the development of soft oxidized ores, prospecting for new ore bodies, expenditures during prospecting stages not included, etc., etc., vitiate in both ways.

One of the main difficulties in cheap extraction of ore is the cost of timber. The wide lodes of the leading mines compel either heavy timbering or filling of stopes. The latter method is usually resorted to and costs about as much, including the timber used, as actual breaking and handling of ore. The present extraction is confined to the comparatively soft free-milling ores, but it is to be hoped that the general amelioration of conditions and introduction of better methods will render it possible to break "blue" ground without increased cost. If we include under this heading pumping, winding and tramming, the average cost has been $2.70 per ton.

The treatment of oxidized or free-milling ores will be at Kalgoorlie, within the next two or three years, a thing of the past, but many of the outside mines have ore adapted to the old lines. The average of milling cost at the six mines mentioned is $1.48 per ton.

What the cost of telluride treatment will be is difficult to estimate. As before stated, the treatment will involve dry crushing, roasting, cyanidation and some after treatment. There are many problems to be overcome, among them the presence of gold, too coarse to be easily soluble in cyanide; the probable necessity of removing some dust (slimes) from the ore to produce a leachable product, and the treatment of these dusts or slimes. Great advance has been made in all these problems, but they are still a good deal in a nebular state, so far as costs are concerned.

The cost of roasting under local conditions is entirely unknown by local experience, but upon a large scale it is not likely to exceed $2.40 per ton.

The average cost of cyanidation of sands at four mines is $1.26 per ton. It appears that slimes treatment by filter press can be done at $1.92 to $2.40 per ton. The proportion of slimes varies with each mine, but by dry crushing a minimum proportion is secured; what proportion (if any) it is necessary to separate in the treatment of the telluride ores is still entirely unknown.

The cost of amalgamation after direct cyanidation of dry crushed ores is still another unsettled feature of which the cost is unknown. Such treatment will involve the use of much water and add considerably to the cost.

It is impossible to estimate accurately expenditures for maintenance and general charges from present costs. Because of the large excess of construction and development going forward, we may for present purposes put it down 72c. a ton.

It will be readily appreciated by the reader that the unsettled state of the industry in the colony, its speculative rather than industrial basis, the unusual conditions to contend with, the lack of even one fully equipped mine to use as a datum point, the unknown costs of roasting and dry crushing, the unknown proportion of slimes to treat, the possibilities of ameliorated conditions, etc., renders the problem one of such complexity as to make any estimate extremely hazardous. From present indications it seems that the cost of working telluride ores in the leading mines at Kalgoorlie will lie somewhere between $8.50 and $10.50 per ton when fully equipped and efficiently managed. Outside mines with free-milling ores and tailings cyanidation with free water will probably lie between $6.75 and $8.50 per ton.

It is not possible in Western Australia, as has been so clearly done upon the Witwatersrand, to forecast the life, capacity or profits of the mines. Westralian ores are erratic in occurrence and value, and as in regions where similar conditions prevailed—the Comstock and at Leadville, for instance—they offer many opportunities for speculative manipulation. But few of the leading mines are proved below 400 ft., and none below 500 ft., and if one could say the deposits would extend to 2,000 ft., or any definite distance of the grade already proved, calculations could be made. If the lodes at Kalgoorlie mantain their value with depth, the equipment in contemplation and course of erection should treble the output in four years, bringing it up to 75,000 oz. a month.

The outside mines now furnish 75 per cent. of the production, and while the increase from them will not be so great, they may conservatively be expected to swell the total to 150,000 oz. monthly.

The ore reserves already opened in many mines are not inconsiderable and will ensure a life of several years. The distance proved is beyond the zone of superficial alteration and the values have been found to maintain. The geologists of the fields have confidence in their permanence.

At present free-milling ores averaging 0.5 oz. per ton, if in large quantities, can be profitably worked. The history of the Rand will in many ways be the history of Western Australia; as the economic conditions of mining become more favorable and the operations are conducted on a larger scale, with increase in proficiency of management, the working costs will decrease and lower grade ores become profitable. Every country possesses more one-ounce than two-ounce ore, and more half-ounce than three-ounce ore. Still, every decrease in working expenses means an increase in tonnage in the leading mines, and an increase in the number of profitable mines on the gold-field. The conditions which have limited the excursions of prospectors have been gradually widened by the extension of settlements and the advance of railways and water supply. Western Australian is a country of surprises; it may do more than this, but it can conservatively be expected to do so much.

IRON PRODUCTION IN GERMANY.—The output of pig iron in Germany in October was 651,122 metric tons. For the ten months ending October 31st, the production was: Foundry iron, 1,065,183; forge iron, 1,296,263; Bessemer pig, 440,872; Thomas (basic) pig, 3,299,399; totals, 6,101,717 tons, against 5,674,487 tons last year; showing an increase of 427,230 tons, or 7.5 per cent.

CHINESE RAILROAD CONTRACTS.—A cable from Pekin announces that a contract has been signed by Mr. Pritchard Morgan on the one hand and the Sub-Commissioner of Mines in Sze-Chuan on the other, granting the former permission to work mines not already opened for all minerals in that province, the government to receive a royalty of 5 per cent. on coal, iron and petroleum. Sze-Chuan is said to be the richest mineral-bearing and industrial province in China.

WOLFRAMITE IN NEW MEXICO.—Besides the deposits in Arizona, to which reference has frequently been made, wolfram ore (Huebnerite) has been found in New Mexico. The first determination and analysis of the ore were made by Mr. E. T. Dumble, long State Geologist of Texas. The claims on which the ore was found are still held by the original discoverer, but very little work has been done upon them, chiefly on account of lack of means to develop them. These claims are 8 miles from the railroad, but are accessible by a good wagon road.

RARE MINERALS IN MONTANA.—According to the Helena "Independent," the occurrence of an exceedingly rare mineral near Florence, Ravalli County, Montana, was proved by Percy Train recently. It occurs in small six-sided prisms, and upon analyses proved to be parisite, a carbonate of cerium, with a general formula (CaF) (CeF) Ce $(Co_3)_3$, with, in this case, a part of the cerium replaced by didymium and lanthanium. This is its first occurrence in the United States, as it was first discovered in the United States of Colombia and has only been found since in Greenland.

NADORITE IN ALGERIA.—The abstract of a paper by L. Gentil, given in the "Proceedings" of the Federated (British) Institute of Mining Engineers, says that in a zinc mine in the Province of Constantine, in Algeria, occurs the chlor-antimoniate of lead known as nadorite found in the gossan of a considerable vein of zinc carbonate worked by the Vieille Montange Company; it is in fine brown flakes, which decompose to a lemon yellow. Associated with it are cerussite, galena, blende, calamite, etc.

The vein of zinc ore traverses red conglomerates, and white marls and limestones of lacustrine origin, of Oligocene, and, in part, Lower Miocene age. The ore has lodged in a great mass at the junction between a marl bed and the overlying limestone. The sedimentary rocks have been apparently much altered by the contact of the vein—the marls receiving a variegated coloration, and the lacustrine limestone being highly impregnated with zinc.

INQUIRIES FOR AMERICAN COAL IN FRANCE.—United States Consul Skinner, of Marseilles, under date of November 15th, 1898, writes as follows: "The steam coal supply of Marseilles has been quite unsatisfactory of late, owing largely to a shortage in the British output, and I have been asked by one large house about the prospect of securing coal from the United States. The specifications submitted to me are as follows: A coal resembling best Welsh is wanted, that is to say: 1. Not giving more than 1 to 7 per cent. of ashes; 2. Developing 8,000 to 8,500 calorific power; 3. Containing the least volatile matter.

"If American coal companies can supply the coal desired at the right price, the opportunity for entering a new and important market awaits them. The published market reports quote Cardiff coal at 40 francs ($7.72), delivered in the coal bunkers at Marseilles. While several of the local houses represent British companies in such manner as to operate against their wishing to introduce a new coal, there are others independently situated and prepared to engage in any business enterprise offering good results."

MORRIS P. JANNEY.

Morris P. Janney, an engineer, well-known throughout Eastern Pennsylvania, died at his home, in Pottstown, after a lingering illness, on November 30th, 1898. He was born in Philadelphia February 1st, 1850. His father was largely interested in iron manufacture in the Schuylkill Valley, and the young man's attention was naturally turned in that direction. Graduating from the Polytechnic College of Philadelphia in 1869, he secured a position with the Pottstown Iron Company, at Pottstown. Here he remained for 15 years, rising steadily until he became manager of the company's blast furnaces, succeeding Mr. Brinton in that position. At the same time he acted as mechanical engineer for the company's rolling mill department.

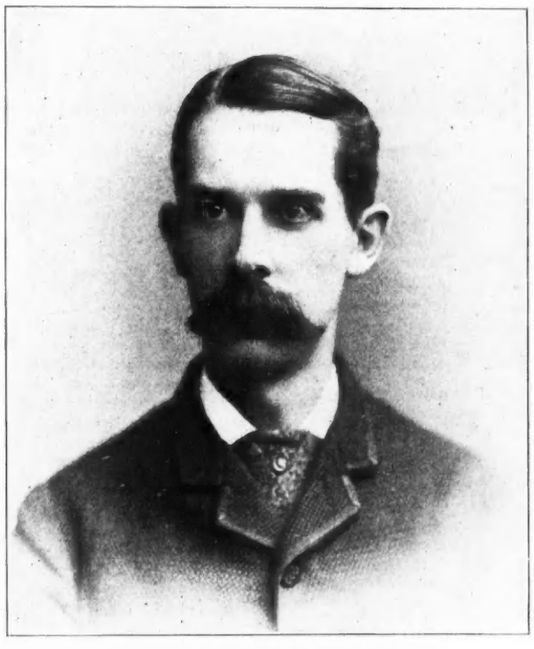
In 1885 he resigned his position at Pottstown to take charge of the property of the Leesport Furnace Company, at Leesport, Pa. After running about a year, however, the owners of this furnace decided to put it out of blast, and it has ever since remained idle, except for a short run to use up material on hand. Commercial considerations have been chiefly responsible for this.

In 1886 Mr. Janney became manager of the Glendon Iron Company and continued in charge of that company's furnaces until 1888, when he returned to Pottstown and took an active share in the management of the business of Janney & Wickersham, iron founders and machinists, a firm which he had founded several years before.

About 1890 he again connected himself with the Pottstown Iron Company as mechanical engineer, and he continued to hold that position until ill health forced him to retire from active business.

He suffered for several years from the disease which finally resulted fatally; it assumed an acute form last summer, when he was obliged to give up all work.

Mr. Janney was one of the oldest members of the American Institute of Mining Engineers, his membership dating from 1874. In his work at Pottstown and elsewhere he introduced many improvements and was always on the watch for new developments. He took an active interest also in local affairs, and leaves many warm friends.



MORRIS P. JANNEY.

COAL IN INDIA.—The official returns give the coal production in India in 1897 at 4,063,127 long tons, against 3,848,013 tons in 1896 and 3,400,801 tons in 1895. Over three-fourths of the output—3,142,497 tons in 1897—was from Bengal.

NATIVE SILVER AND QUICKSILVER IN THE SALA MINE, SWEDEN.—According to the abstract of a Swedish paper, prepared for the "Transactions" of the Federated (British) Institute of Mining Engineers, some old workings of the Sala Mine, Sweden, have been reopened for the purpose of getting the zinc ore. In the last six months of 1897 the production reached 4,746 tons of ore, with a calculated percentage in the prepared stuff of 39 per cent. of zinc. The native silver occurs in a gray fine grained dolomite, in thin scales or flakes somewhat encrusted with sulphide; very little of it has been found in the crystallized condition. Silver amalgam occurs, on the other hand, most often in crystals, i nsmall druses in the dolomite. These are largely filled with quicksilver, which sometimes adheres to the crystals of amalgam so tenaciously that it is with difficulty separated from them.

The mercury occurs partly in small quantities, filling hollows in the dolomite, partly in cracks and clefts in the rock, and also in the conditions mentioned in the previous paragraph. That mercury is a constant associate of the Sala ores is proved by the fact that when these were treated by the Russell process about 600 kgs. of it were got in 120,000 tons of ore. Cinnabar is found in the dark gray serpentine schists which are associated with the dolomite.

FUEL AT THE CAYLLOMA MINES, PERU.*

By Bernard Hunt.

The silver mines of the district of Caylloma, near Arequipa, Peru, have in the past been largely dependent on pumping operations for the extraction of their ores, and may again have to sink below water line, owing to the shallowness of the valleys and in order to get below the old workings of former Spanish owners. The Caylloma Silver Mining Company, Limited, must also command large supplies of fuel for the chloridizing roasting of the poorer ores for subsequent treatment by pan amalgamation.

Owing to the want of suitable timber, the great distance from railway communication, and the high rate of freights, every effort has to be made to obtain material near at hand which may serve as fuel. It is found, however, that local supplies are not equal to the demand made on them, nor are certain kinds suitable for raising steam, though they very well serve for roasting, so that the balance has to be made up with coal bought of the railway company, and carried from the nearest station, a distance of 100 miles, to the mines.

At the mines fuel is used only for raising steam and pumping, hauling, and for the occasional running of other small engines. When water had to be raised at the rate of 15,000 gallons per hour, 90 lbs. to 100 lbs. of steam were maintained on a 100 H.P. tubular boiler of the Babcock & Wilcox type, assisted by a Cornish boiler keeping 60 lbs. to 70 lbs. pressure. The consumption of coal then amounted to about 200 tons per month, or its equivalent in turf or yareta, the only local substitutes found to be sufficiently economical and capable of maintaining the desired heat. From repeated trials of these fuels, they are found to compare as follows: Coal to yareta as 1 to 3; coal to turf as 1 to 5.

Coal which had to be transported from the railroad to the mine by mules and llamas cost at the mine about $35 a ton. Turf cost, delivered at the mines, $6 a ton, and was therefore somewhat cheaper than coal. Very little yareta is used at the mines.

At the amalgamation works the fuels burned are yarequa, taquia (llama dung) and petroleum shale. Turf is only used for raising steam, and not for roasting ores. At the mill coal costs about the same as at the mine, $35 a ton. The relative quantities of the different fuels required, their cost per ton and the cost of roasting a ton of ore compare as below:

	Cost per ton.	Relative quantity.	Cost of roasting per ton.
Coal	$35.00	1.0	$3.84
Yareta	8.40	3.0	2.78
Turf	4.80	5.0	2.68
Shale	21.60	3.0	6.96
Taquia	1.56	3.2	1.08

Yareta, turf, and taquia can only be brought in during the dry months, May to November inclusive; sufficient must be stocked, therefore, during those months to meet the requirements of the other five months, which make up the wet season.

Yareta ("Bolax glebaria") is a highly resinous plant, firm and compact, found distributed over the tops and sides of the mountains, cropping out from under the boulders, and spreading into large mounds often as much as 20 ft. across. Cutting commences as soon as the rains begin to hold up. The work is very cheap, as the mounds are simply broken up with chisel-headed bars, and the pieces left for three or four months to dry on the spot. Yareta being of very slow growth, gets scarcer every year, already having to be brought considerable distances. It is probable that in a few years' time there will be little or none obtain-

* Abstract of paper read before the Institution of Mining and Metallurgy, London.

able except at such prices as will make it more economical to burn coal.

At a distance from Caylloma of 18 miles, and at an altitude of 18,000 ft. above sea level, there exists a series of beds of shale, more or less saturated with petroleum. The best of these beds are quite unworkable economically, on account of the dip and strike, which render necessary heavy pumping operations. One bed only was worked by the company, but has recently been abandoned as unpayable. In this particular mine there are three bands of shale, varying from ½ in. to 1 in. thick each, and some 2 ft. apart. Having 25 per cent. of volatile matter, a sufficiently good flame is obtained to make it a fair fuel for roasting.

The mine was worked on contract at $4.80 per meter for tunneling, and 19.2c. per quintal for the shale produced. Only two drifts could be run dry, and these very close together, so that the ground opened up only gave about 1½ tons of shale per linear meter. Some of the other beds of the series have bands of from 3 in. to 6 in. in thickness, and give from 27 to 30 per cent. of volatile matter. Being, moreover, some miles nearer the works, they would have proved of value to the company except for the objection above noted.

Turf, which is cut from the marsh grounds, is the more or less decomposed root matter of a species of stiff moss. When much interstratified with sand and mud it is not suitable for fuel. When clean, a large bed may have a depth of from 10 to 15 ft. of good turf, and is then very economical to work. Cutting is commenced by removing the upper soil in patches of about 25 ft. square. It is better to expose only small surfaces, so that the frost may more easily be kept off by covering at night with loose sods what is in process of being cut, otherwise it is almost impossible the following morning to get a spade through the frozen surface. The thermometer during the months June to August registers on the average 22° of frost during the night, often in July going as low as 5° F.

The upper soil removed, the turf is cut in terraces about 8 in. deep with spades, so that the sods measure each about 8 by 4 by 1 in. These are carried away as cut and laid on the pampa. When thoroughly dry the turf is sacked and conveyed to the mines, where it is stacked and covered up to protect from snow during the wet season. Turf needs about a month to dry thoroughly, for though the sun is powerful by day and the winds strong and dry, the sods get so frost-bound that it is only with difficulty the moisture can be driven off. Dry turf weighs about 7½ lbs. per cu. ft., and is in appearance like coarse-cut tobacco.

Taquia is collected by Indians from the corrals and pastures on their own estancias. The llama family drops its excrement in regular rows down the hill sides or on big heaps, so that the work of collecting it is but a trifle. When dry it is brought in, and the vendors receive 6c. per quintal, an additional small bonus going to the contractor, who undertakes to travel about the country and induce the Indians to bring the fuel in. In this way taquia is obtained from great distances, and the quantity increases year by year.

LIGNITE MINING IN DALMATIA.—There are four lignite mines at present being worked in Dalmatia, the output from which last year amounted to 72,079 tons, or 3,271 tons less than in 1896.

GERMAN IRON ORE TRADE.—The exports of iron ore from Germany, chiefly to France and Belgium, for the ten months ending October 31st were 2,196,120 metric tons, against 2,443,734 tons in 1897. For the same period the imports were 2,744,020 tons, against 2,475,455 tons in 1897.

QUICKSILVER ORES FROM CHINA.—According to a paper by P. Termier, in the "Bulletin de la Societe Francaise de Mineralogie" (volume XX., 1897, p. 204), the writer examined and analyzed some fine specimens of cinnabar crystals and granular onofrite, brought by a French mining engineer from the mercury mines of Wen Shan Chiang, Province of Kivei Cheu, Central China.

	Cinnabar.	Onofrite.
Quicksilver	85.75	77.3
Sulphur	13.70	10.3
Selenium	....	8.4
Zinc (with traces of iron)	....	1.3
Totals	99.45	97.3

The cinnabar occurs in good crystals, and the onofrite as black patches, with a granular and lustrous fracture. Their chemical composition is as follows:

In druses in the quartz veins, the cinnabar crystals attain a length of nearly 1 in., and they are surrounded and often pierced by fine needles of quartz.

IRON ORE DISCOVERY IN SCOTLAND.—A Scotch correspondent of the London "Colliery Guardian" writes that geologists have long been of opinion that the Western District of Ardnamurchan was peculiarly rich in various minerals. It has always been accepted as a well established fact that Ben Hiand abounded in auriferous deposits; that the limestone bed extending from Mingary on the south to Swordle on the north was flanked and surmounted at several points by coal strata, and that iron, copper, mercury and tin were widely diffused throughout the district. Yet, until quite recently, no one seemed inclined to come forward with the necessary capital to verify these surmises, or turn them to practical account. Three years ago the Ardnamurchan estate was purchased by Mr. C. D. Rudd, and at his instance a geological survey of the district was made at Ormsaigbeg, where a rich stratum of iron ore (mountain ironstone) was struck. Indeed, several extensive beds of the metal were found to traverse the locality; and the discovery immediately attracted the attention of an influential mining company. The result of subsequent negotiations is that arrangements are already in an advanced stage for the work of excavating to be commenced. A representative of the company, an engineer, and some assistants have arrived in the district, and preliminary operations are to begin forthwith. The spot where the mines are to be sunk is situated high up among the hills, about 300 ft. above the level of the sea. It is distant about 2¾ miles from Kilchoan Bay.

SLATE IN INDIA.

Slate occurs in the Cuddapah, Kistna and Kurnool districts of the Madras Presidency, according to the official "Review of Mineral Production in India." There are no true slates in the Madras Presidency, that is, approaching the roofing slates of commerce. Slabby slates are procurable, but not of large size. Occasionally slaty flags of tolerable size are obtainable. Samples of slate are found near the villages of Mohari and Belgoa, in the Saugor District of the Central Provinces, in the vicinity of the Cawnpur Road. In the Bagalkote taluq of Bijapur a hard rock occurs, which is prized as a building stone. Slate is also found in Jamalpur and Dhararah hills, near Monghyr, and in the Kymore hills, in Shahabad (Bengal); in the Banda, Jhansi, Dehra Dun, Kumaon and Garhwal districts of the Northwest Provinces; in the Simla and the Kangra districts of the Panjab, and in the Jaipur, Ulwar and Dholpur States of Rajputana. Metamorphic black slate is stated to occur in the Nemkhara Bhumiat, in the Bhopawar States of the Central India Agency. The stone is used for building, flagging and other masonry structures, but not extensively, as it cannot be easily split into thin slabs.

The estimated production of slate in Monghyr, Bengal, is 750 tons for 1897. A quarry exists near the village of Kuan, in Jabalpur District, in the Central Provinces, but has not as yet been regularly worked. In Rajputana quarries exist in Jaipur, Ulwar, Bundi, Tonk and Dholpur. In Jaipur 9,208 tons, valued at 30,827 rupees, were quarried during the year 1897. In Bundi the production was 5,120 tons, valued at 8,750 rupees, and in Tonk it was 2,800 tons, valued at 831 rupees. In Central India metamorphic black slate occurs in Nemkhera, Bhopawar State.

The estimated production of slate in India during 1897 amounted to 26,169 tons, against 22,125 tons in 1896.

RECENT GOLD DREDGES.

The accompanying illustrations show one of the latest gold mining dredges built by the Bucyrus Company at South Milwaukee, Wis. This dredge is the property of the Coast Company, of Philadelphia, and is now at work on Grasshopper Creek, in Montana, where several other companies are also engaged in dredging. The first illustration is from a photograph of the dredge at work; the second shows the dredge and its surroundings.

This dredge is of the elevator or chain bucket type, which has been adopted by the Bucyrus Company as best adapted for dredging gold-bearing gravels. In this type the action of the endless chain of buckets is slow and quiet, and the material is picked up clear from the bottom with the smallest amount of agitation, and in a manner best calculated to retain the gold. The buckets are water-tight, and retain their entire contents until emptied by inversion at the top. The delivery of material is continuous and at the center of the boat instead of being intermittent and at a distance over the side of the boat, as in the dipper dredge. The elevator buckets also bring up a considerable proportion of water, which facilitates the washing operation, and the material is brought up in smaller masses than in the case of the dipper dredge, and hence is more easily broken and disintegrated in the screen. All the dredges in the Australian and New Zealand gold-fields, where a large number of them are successfully in use, are of this type.

The buckets discharge the material into a hopper, through which it passes into a revolving screen. This screen is of sufficient internal size to enable it to pass the largest stones that can be brought up in the buckets, usually 18 in. to 2 ft. in diameter, and it is of sufficient length to thoroughly screen and wash the most difficult material. A series of streams of water are introduced into the interior of the screen, thoroughly washing the gravel as it is tumbled over and over. The size of the opening in the screen depends upon the character of the material, and the coarse tailings are discharged overboard. The stone-chute is high enough and has sufficient inclination to discharge the material clear of the side of the boat, so that no obstruction can take place on account of the accumulation of tailings. From the under side of the screen there is a discharge of all the fine material, including the gold, together with a considerable quantity of water. This is carried off and over the stern of the dredge through a sluice-box of the proper size and inclination, and containing a series of riffles in which the gold is caught. The length of this sluice-box is amply sufficient both to carry the tailings clear of the dredge and to save all the gold. Its operation is at once simple and complete, and can be readily comprehended by any practical hydraulic miner.

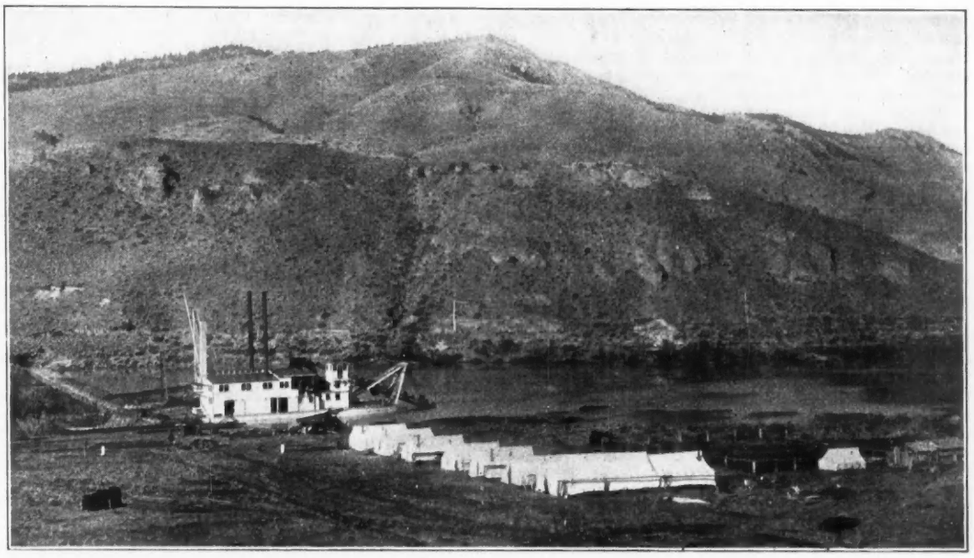
The dredging machinery proper is throughout of very solid construction. These dredges have been subjected to the most severe tests, and their construction has been reduced to a standard system. They are in every way substantial and durable machines, and able to encounter the hardest kind of material effectually and without injury to themselves.

The buckets are of steel and are so proportioned as to have a large margin of strength over and above the maximum strain that can come upon them, so that there is no risk of their breaking. The buckets on all the elevator dredges built by the Bucyrus Company are fitted with Robinson's patent improved protected and lubricated joint connections, whereby the wear and tear of the pin joints is greatly reduced. The hinge pin is of unusualy large diameter, and has a large and wide bearing for the whole width of the rear end of the bucket, the pin being held fast in the narrow bearings at the front end. Renewable bushings of manganese steel are employed, together with a self-expanding packing ring and proper provision for lubrication. The result is that where formerly pins and bushings had to be renewed every few weeks or months the wearing parts will last three to five seasons. The engines which drive the buckets are of ample power to do the work in hard material, while at the same time they are the weakest part of the machine. They are purposely so made in order to fix the limit of the maximum strains that can occur. If the buckets should encounter an immovable resistance when running at full speed and

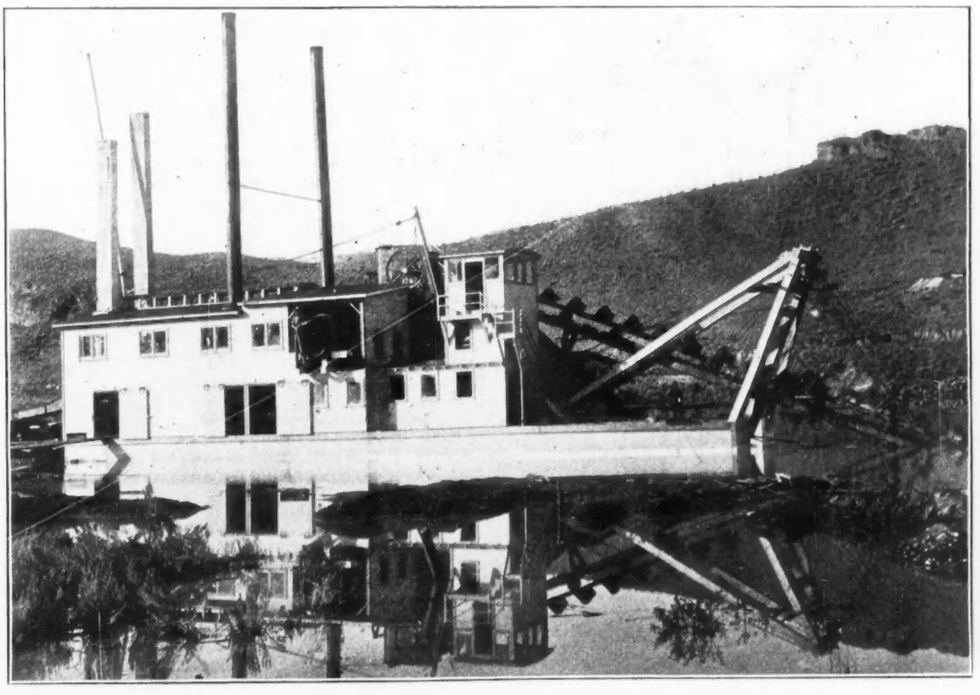
with the throttle wide open, at a pressure of 100 lbs. of steam, nothing but the stoppage of the buckets would occur. In the machine shown the buckets have a capacity of 5 cu. ft. and the dredging can be done to a depth of 35 ft. Water is supplied to the sluices by a centrifugal pump.

The latest dredge built in New Zealand, which is the home of the oldest and most successful gold-dredging industry, is the "Lady Ranfurly," which has just been put at work on the Kawarau Gorge. From the "New Zealand Mines Record" we learn that the "Lady Ranfurly" is 110 ft. in length, but a staging at bow and at stern increases the total deck length to 120 ft. The pontoons are 13 ft. wide and 7 ft. deep. The well is 5 ft., so that the total breadth of the craft is 31 ft. The pontoons are of the best material. The stringers are of ironbark, the frame of hardwood, and the planking kauri. The ladder is 75 ft. from center to center, and weighs 10 tons without mountings. The buckets weight 7 cwt. each, and have a capacity of 5¼ cu. ft. The pins measure 2½ in. in diameter, and each of the links weighs 84 lbs., so that the set of four links weighs 3 cwt. Above the well is a traveling crane running from the tumbler-framing to the gantry, 72 ft., the object of which is to enable the bowlders brought up from the river-bed to be picked out of the buckets, run back to a line of rails near the engine, leading to a sliding door in the side of the building. The boulders can be rolled along the rails and dropped overboard. This piece of machinery is capable of getting a 2-ton boulder out of the way. The engine is 16 H. P. The engine-room will have a ceiling above which will be a store-room, and will be distempered throughout. The boiler is of good design. The boiler-casing, besides the usual brick lining, has a silicate packing, and, as it rests not directly on the floor, but on rails, the danger from fire is reduced. There is a steam auxiliary winch to assist in working the dredge when working about a large bowlder. The pump is an 11-in. centrifugal, capable of raising an abundance of water. The screen is 25 ft. long, and is driven by friction. The tables measure 19 ft. by 17 ft., and are six in number. The crown wheel weighs 2 tons. There is an office for the accommodation of the dredgemaster, and above the office is a sleeping-room for the watchman. The total cost of the dredge will be close upon $42,500. The dredge is not only fitted up with every necessary for dredging proper, but has, in addition, a repair shop containing a lathe, drill and other tools.

The whole of the machinery is covered by a roof going from side to side across everything, and the workmen will have plenty of room to move about, which is not the case on most dredges. The elevator is 85 ft. long, and is capable of stacking the tailings to a height of 35 ft. The machinery has been put in position by Mr. Alexander C. McGregor. It was designed by Mr. T. W. Payne, who has had a great deal of experience in dredging work.



COAST COMPANY'S DREDGE ON GRASSHOPPER CREEK, MONTANA.



COAST COMPANY'S DREDGE ON GRASSHOPPER CREEK, MONTANA.

IRON ORE IN INDIA.—Although a number of deposits of iron ores are known to exist in India, and some have been worked from a very early state, the production continues small. In 1897 it was 43,314 long tons, against 18,776 tons in 1896, and 32,741 tons in 1895.

CYANIDE PRACTICE IN UTAH.

From our Special Correspondent.

Gold recovery by cyaniding was first proved an assured economic success at Johannesburg, in South Africa, and at Mercur, in Utah, and it is noteworthy that reliable profit-paying results were achieved in these opposite corners of the world at about the same period. In the former field during the past seven years, however, there have been many advances in the winning of a higher percentage of metallic extraction, but in Utah almost none. In the Witwatersrand District there are 60 plants operating, and each month an official statement is published, giving the number of tons treated by each plant, the average gold contents of the ore, the percentage recovered by amalgamation, the percentage recovered by cyaniding the tailings, and the percentage recovered by cyaniding the slimes—where there is a slimes annex. There is a constant rivalry and an endeavor by each management to reach the best practice, and the consequence is that chemists and metallurgists of ability are ever devising ways and means to improve the treatment. In Utah the general rule has been to be content if a profit is made over cost of mining and milling, apparently indifferent to the amount of gold left in the tailings. An assayer of limited experience has generally been in charge, and as a result the plants which have been in operation the longest obtain no better extraction than they did five years ago; in some instances during the current year the waste was greater, at times reaching 50 per cent. of the gold in the ore sent to the mill. In this general statement the De La Mar Mercur plant, which has been operating only a part of the present season, is not included, and in the metallurgy of cyaniding it is the pleasant exception in the district. Recently tests have been made at Johannesburg on heating cyanide solutions to secure a quicker and higher extraction, but as yet no tabulated results have been given out. In this particular some experiments conducted at the Sacramento Mill, at Mercur, the past month by Colonel H. G. Heffron, show that the gold is most readily dissolved at 95° F.; if the solution is at a greater heat there is no benefit, and below 80° F. there is considerable falling off in the solvent power. All agree that a warm leaching room is a desideratum.

THE ST. MICHEL ELECTROLYTIC CHLORATE WORKS.*

By John B. C. Kershaw.

As a result of the progress in electrical engineering science during the past 15 years, the southeastern provinces of France, through which flow the tributaries of the Rhone, are becoming of great importance as manufacturing centers. Since 1890 a large number of important water-power developments have taken place in the valleys of the Arc and of the Isere, and over 10,000 H. P. is already furnished by the former river to the manufactories of chlorate of potash, aluminum, and calcium carbide, situated along its banks. The Arc rises near the Isere in Mont Iseran, Savoy, 9,236 ft. above the sea lavel. After a rapid course of 75 miles it joins the Isore at a height of 934 ft. above the sea. The town of Modane is situated on the Arc at a point 3,579 ft. above sea level, and is connected with the railway system of the Rhone valley. Above Modane the power of the Arc has been chiefly utilized for sawmills, and the larger developments have occurred below that town, on account of the greater facilities for railway communication. Of these manufactories, the chlorate works at St. Michel, 6¾ miles below Modane, is one of the most interesting.

This works is owned by the Societe d'Electrochimie, of Paris, and was built in 1894. Extensions to its present size were carried out in 1896. At this works between 3,000 and 4,000 H. P. is utilized in the manufacture of chlorates of potassium and sodium by the Gall & Montlaur process. The power utilized in the works is derived from the River Arc at a point in the Maurienne Valley, 1½ miles above the works. The torrent in this valley at the time of the melting of the winter snows upon Mont Iseran is most impetuous, and in the past enormous damage has been done to the villages situated along its course. This rush of water at certain seasons of the year has, of course, been taken into consideration in designing the larger hydraulic installations which are now found in the valley.

The water which operates the turbines at St. Michel Chlorate Works is conveyed from the intake by an underground channel, 1¼ miles in length to a point 230 ft. above the works. From this point, two pipe lines, 990 yds. long and 47 in. in diameter, carry the water to the turbine house. The two pipe lines deliver 1,760 gallons water per second, and this volume serves to operate 12 turbines of 200 H. P. and four of 400 H. P. Each turbine is keyed direct to a Thury dynamo, and is run at a speed of 300 revolutions per minute. The larger dynamos deliver 1,000 amperes at 200 volts, the smaller ones 500 amperes at 200 volts. The total electrical energy available for the manufacture is therefore 2,000 kw.

The electrolytic process by which chlorate is made at this works is in principle that described by Charles Watt in patent No. 13,755 of the year 1851. A solution of an alkali metal chloride is electrolyzed between insoluble anodes, at a moderately high temperature, and the less soluble chlorate salt, formed by the reaction between the chlorine liberated at the anode and the caustic alkali formed at the cathode, is separated by crystallization.

Chemically, the manufacture is explained by the following equations:

$$6\,K\,Cl = \underset{\text{Cathode.}}{6\,K} + \underset{\text{Anode.}}{6\,Cl.} \qquad (1)$$

$$6\,K = 3\,H_2O = 6\,KOH + H. \qquad (2)$$

$$\begin{cases} 6\,KOH + 6\,Cl = 3\,KO\,Cl + 3\,K\,Cl + 3\,H_2O. \\ 3\,KO\,Cl = K\,Cl\,O_3 + 2\,K\,Cl. \end{cases} \qquad (3)$$

No. 1 represents the electrolytic decomposition of the chloride salt; No. 2 the instantaneous reaction between the alkali metal and the water at the cathode; and No. 3 the two stages of the chemical reaction which occurs when chlorine and caustic alkali are brought together in a hot solution. Messrs. Gall & Montlaur's process is, therefore, essentially the same as that patented by Watt in 1851, and their English patent, No. 4,686, of 1887, chiefly refers to the apparatus used in carrying out the electrolysis. Rectangular vats lined with lead are used, each vat having a capacity of 11,000 gallons. The vats are insulated from the floor by oil cups. The anodes are of an alloy of platinum and iridium (90 per cent. platinum) which is found to stand the action of the chlorine better than pure platinum. They are only 1 mm. in thickness. The cathodes are of an iron-nickel alloy, and are covered with asbestos cloth in order to carry off the hydrogen liberated at their surface.

A very large volume of H (about 19,000 cu. ft.) is produced for each ton of chlorate obtained, and this, carrying with it particles of the salt solution as it escapes, coats everything in the neighborhood of the electrolyzing vats with a crust of salt. In the process as originally carried out, diaphragms of special construction were used, and the caustic alkali formed in the cathode chamber was carried by external pipes to the anode chamber, where the reaction with the chlorine occurred. These are, however, believed to have been discarded in favor of open vats; but upon this, as upon other important details of the process as now carried out at St. Michel, M. Gall, the director of the Societe d'Electrochimie, is naturally not very communicative. MM. Gall & Montlaur were the first to successfully carry on the manufacture of chlorate of potash by the electrolytic method, and it is hardly to be expected that they will give away the results of their experience and skill in the conduct of their process.

A current density of 465 amperes is said to be used. In this way the solution in the vats is maintained at a temperature of 45° C., and no external heating is requisite in order to promote the conversion of the hypochlorite of potassium or sodium into chlorate. The electrolysed solution is run off from time to time, the chlorate is separated by cryztallization, and the electrolyte is brought up to its original strength by addition of fresh chloride.

When using potassium chloride as the starting points of the manufacture, the same electrolyte can be used for some weeks without complete renewal. The presence of metallic oxides in the vat solutions must be carefully avoided, since these instantaneously decompose KClO into KCl×O. The chlorate obtained from the vat liquor requires recrystallization before it is ready for the market.

The Societe d'Electrochimie, in addition to the works at St. Michel, possesses a chlorate factory at Vallorbes, in Switzerland, where 3,000 H. P. is utilized. The two works together are said to produce 1,800 tons chlorate per annum. The output per E.H.P. day at the commencement of the manufacture was only 1 kg. in place of the 269 kgs. demanded by theory, but M. Gall states that the yield has been materially increased since then. No details of the cost of manufacture at either Vallorbes or at St. Michel have been published, but the writer made an estimate last year, according to which—with power at 0.1d. per E.H.P.-hour, 1 lb. of chlorate could be produced by the electrolytic process for 2¾d. In the year 1891 chlorate of potash was selling for 5½d. per lb., and chlorate of soda for a slightly higher price, so that the manufacture of these chemicals must have given a very fair return upon the capital invested in it. Since that date, however, the competition between the producers by the older chemical method and by the electrolytic method has served to reduce the selling price to 3¾d. per lb., and the margin for profit is therefore correspondingly narrowed. The outlook for the future is also rather gloomy, since other electrolytic chlorate manufactories in Norway, Switzerland, and the United States are entering the market with their products, and the keener competition betwen the manufacturers by the older process and the new electrolytic method is likely to still further depress prices. The Societe d'Eelctrochimie is, however, well situated for producing chlorate cheaply in St. Michel and Vallorbes.

*Abstract of article in the London "Electrical Review," No. 1,096, November 25th, 1898.

SALT IN INDIA.—According to official returns, the production of salt in India in 1897 amounted to 923,118 tons, a decrease of 103,809 tons, or 10.1 per cent., from 1896. Of the total in 1897, the British Provinces furnished 798,203 tons. There are three sources of supply: 1. The evaporation salt from the lakes and pits of Rajputana, which supplied about one-seventh of the total. 2. The rock-salt of the Panjab, which formed about one-eleventh of the total. 3. Evaporation salt obtained directly from the sea, which made up the balance.

GEOLOGICAL SURVEY OF NATAL.—The Government of Natal has decided to undertake a complete geological survey of the colony mainly for the purpose of developing the coal and other mineral resources of the country. It is believed that the coal mining industry especially is capable of a considerable expansion. The services of Mr. W. Anderson have been engaged as Government geologist to superintend the survey, and he will shortly sail from London for Natal. Mr. Anderson has for some years been employed on the Indian Geological Survey, while before that he was acting in a similar capacity in New South Wales.

NITROGEN IN THE COAL OUTPUT.—An interesting calculation of the available nitrogen in coal output was submitted at a recent meeting of the Scottish section of the Society of Chemical Industry by Messrs. W. Carrick-Anderson and James Roberts in the course of a paper on "Some Chemical Properties of Scottish Coal." The authors pointed out that the annual British output of 200,000,000 tons of coal contained on the average 1 per cent. of nitrogen, representing 2,000,000 tons of combined nitrogen, equivalent to nearly 9,500,000 tons of sulphate of ammonia, from the United Kingdom alone, if it were possible to recover it completely in that form. But even the present imperfect methods of recovery would be capable of producing 1,250,000 tons annually, if the whole of the output were carbonized, and the ammonia recovered, as is done in gasworks and blast furnaces. The production of Continental Europe would probably be as much, while America, India, China and many other countries could furnish contributions of a very considerable amount.

THE JEFFREY ELECTRIC LOCOMOTIVE.

The demand for an electric locomotive for use about iron works and steel mills led to the designing of such a machine by the Jeffrey Manufacturing Company, Columbus, Ohio. This type of locomotive was designed to meet the demand, and was based upon the experience the manufacturers have had in the construction of such machinery. That it has proved a success is demonstrated by the number installed since placing on the market. It was designed with a special view of making it easily handled, compact, strong, and having all parts easily accessible.

The frame consists of two solid gray iron castings, securely bolted together with turned bolts in reamed holes. This frame can be mounted either inside or outside of the wheels, according to the gauge of track on which the locomotive is to operate, and rests upon four spiral springs, supported by journal boxes of the standard railway type. There are four wheels and two axles; the wheels are of the open-plate chilled type, and are keyed, as well as forced on the axles. The axles are of hammered steel, acurately ground and turned down.

There is but one motor, mounted in such a manner that it receives no injurious vibration when the locomotive is in operation. The motor is of the multipolar type, series wound, with iron-clad armature and designed especially for this class of work. The armature and field coils are completely encased in the cast-iron field frame, and are thoroughly protected from injury. The entire internal mechanism of the locomotive is fully protected by a covering, which is hinged on the frame in such a manner that it can be raised and the motor reached with ease. The locomotive is provided with a gong and headlight. The controller is located on one end of the locomotive in such a position that the controller-wheel, brake-wheel and sand box lever are convenient to reach without delay when necessary. The sand-boxes are located so that the sand is delivered in front of the driver when running in either direction. The trolley is so designed that it can be reversed by the operator without leaving the seat.

The illustration given herewith shows the locomotive complete, ready to operate. The locomotive is well fitted for the work which it was designed to perform, and is a compact and serviceable machine.

JEFFREY ELECTRIC LOCOMOTIVE.

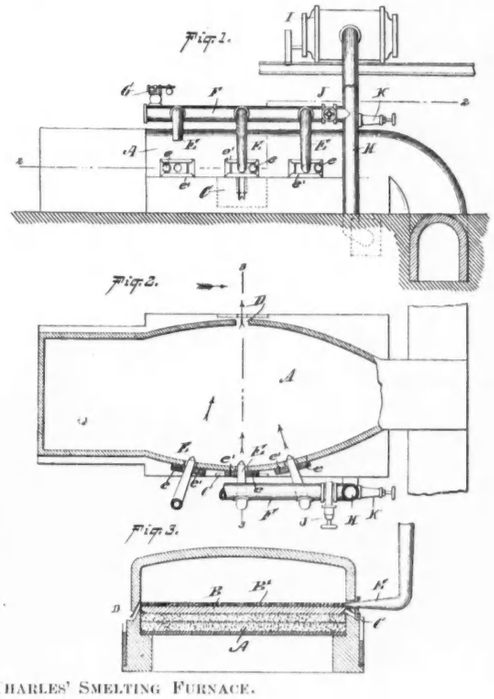
THE CHARLES REVERBERATORY FURNACE.

The accompanying illustration shows an improvement in reverberatory smelting furnaces recently devised and patented (United States Patent No. 608,837), by Henry L. Charles, of Butte, Montana. The object of this improvement is to provide apparatus for conveniently and quickly removing the molten floating slag from the molten metal without danger of chilling the metal.

Fig. 1 is a side elevation of the improvement. Fig. 2 is a sectional plan view of the same on the line 2 2 of Fig. 1, and Fig. 3 is a transverse section of the same on the line 3 3 of Fig. 2. The improved apparatus is provided with a hearth A, which may be composed of a metal base-plate supporting a bed of fire-brick. The hearth contains the molten metal B and the slag B′, likewise in a molten condition and floating on the top of the molten metal B. The latter can be withdrawn from the hearth in the usual manner through the matte tap-hole C, and the Slag B′ is adapted to be driven through a slag-hole D, formed in one of the walls of the hearth and in a plate attached to said wall, as is plainly indicated in Figs. 2 and 3. The floating molten slag B′ is driven into this slag-hole D by the force of an air blast or blasts issuing through the tuyeres E, held approximately horizontal in the wall of the hearth A, located opposite the one containing the slag-hole D.

The discharge ends of the tuyeres E are somewhat above the level of the molten metal B, so as to cause the air to act directly on the molten slag B′ to drive the same laterally into and through the slag-hole D. As shown in Fig. 2, the tuyeres E point toward the slag-hole D to produce the desired result. They are connected with an air-chamber F, provided at one end with a safety valve G, and connected at its other end with the blast-pipe H for delivering the usual blast to the furnace. The blast-pipe H is connected with a blower I or other source of air supply, and the connection between the pipe H and the chamber F is controlled by a valve J, contained in the chamber F near the pipe H. A second valve K is held in the air-blast pipe H, below the entrance of the chamber F into the said pipe H, so that when the said valve K is closed and the valve J is opened the air-blast passes from the pipe H into the chamber F and from the latter through the several tuyeres E upon the molten slag to drive the same to and through the slag-hole D, as previously explained.

It is understood that it requires but a few minutes to remove the slag from the molten metal, and as soon as this has been accomplished the valve J is closed and the valve K is again opened to permit the air to pass over its regular course to the furnace. Doors e, respectively rolling in guideways e, are respectively provided for the tuyere, openings, and by these means the tuyere openings may be closed when the tuyeres are withdrawn. The hearth A, with its sides bulging or curved outward, enables the tuyeres E to be arranged properly with reference to the slag-hole. This arangement is such that the tuyeres extend radially with reference to the slag-hole, and direct the slag in one gradually contracting sheet through the slag-hole.



CHARLES' SMELTING FURNACE.

PETROLEUM IN INDIA.—The production of petroleum in India in 1897, as officially reported, was 19,128,828 gal., of which Burma furnished 18,904,710 gal., Assam 222,077 gal., and the Panjab 2,041 gal. As compared with 1896, there was an increase of 4,071,934 gal., or 27 per cent.

SULPHUR IN RUSSIA.—A company has been formed in Moscow to work the sulphur beds of Czarkowski. The sulphur is to be separated from the ore by the Patkonoff process, in which the ore is heated by steam in a closed vessel and the melted sulphur drawn off through a sieve.

PETROLEUM IN HUNGARY.—According to an abstract of an official report given in the "Transactions" of the Federated (British) Institute of Mining Engineers, the oil-bearing strata in the District of Kovosmezo, in Hungary, are of Middle Eocene (early Tertiary) age, and consist of pale gray, finely micaceous thin-bedded sandstones, veined here and there by calcite; then come gray marls and dark clay-slates, which are interbedded with a highly micaceous, rotten, bituminous sandstone. The last named occurs at a high horizon, generally in the middle of the basin, while the first mentioned sandstones occur at the edges of the basin. Numerous folds characterize this series of rocks.

Within the last 20 years several companies have put down borings, four of which only have been carried to any considerable depth, but the results so far are unpromising. Down to 780 ft. no great quantity of petroleum is available, and in order to ascertain whether it occurs in workable quantity lower down, one would have to bore through the entire Middle Eocene series. The disturbed condition of the strata does not permit of an exact estimate being made as to the depth this would imply, but it could hardly be less than 1,600 ft. The report recommends that a test-boring should be put down opposite Lopusanka, at the Bubna ridge, in the neighborhood of an anticlinal.

QUESTIONS AND ANSWERS.

(Queries addressed to this department should relate to matters within the special province of this periodical, such as mining, metallurgy, chemistry, geology, mineralogy, machinery, supplies, etc. As it is manifestly impossible to devote space to all the questions and notes constantly received, preference will be given to topics which seem to be of interest to others besides the inquirer. We cannot here undertake to give professional advice on problems requiring special investigation and which should be obtained from a consulting expert. Brief replies to questions will be welcomed from correspondents. While names will not be published, all inquirers should send their names and addresses. Anonymous questions will not be answered.—Editor E. & M. J.)

Copper Extraction Process.—I notice a reference in a recent daily paper to a new process for extracting copper from ores, of which the special feature is the use of copper chloride as a solvent. The article states that the process has been so successful that a number of works are being equipped for it in Germany. Can you direct me to any publication giving full details of the process, which is also said to be adapted for the treatment of low grade zinc ores?—L. C. B.

Answer.—The article you speak of evidently refers to the Hoepfner process, in which there is used a heated solution of cupric chloride, saturated with calcium chloride or common salt. The cupric chloride is not the lixirant calcium chloride or chlorhydric acid being the active agent. A description of this process was given in the "Engineering and Mining Journal" December 19th, 1896, page 584, and "The Mineral Industry," Volume II., p. 284.

Standard Consolidated Mining Company.—What amount of surplus is carried by this company? What is the tonnage of ore reserves exposed in the mines? When may the next dividend be expected? Will the mill recently destroyed by fire be replaced soon?—G. S. W.

Answer.—1. The Standard Consolidated Mining Company usually carries a large surplus. By the latest monthly report this amounted to $83,288.

2. In the last annual report of the company there was said to be, on a conservative estimate, between 6,000 and 7,000 tons of ore in sight. The quantity varies constantly, as ore is taken out and new development and exploration work is carried on.

3. As to the next dividend we have no information whatever. The company has not announced its intentions in this respect.

4. We are informed that the mill recently destroyed is to be rebuilt as soon as the necessary material can be delivered at the mines and the weather will permit building operations.

Manganese Ore.—What are the chief purposes for which high grade manganese ore is used? Who are the principal consumers?—E. C.

Answer.—We are doubtful what you mean by "high grade ore," the term "high grade" being relative. Pure pyrolusite (manganese binoxide), which is the highest grade of manganese ore, contains 63.64 per cent. manganese, but ordinarily the grade of manganese ore is reduced by the presence of iron oxides and lower oxides of manganese. The greater part of the manganese production of the world is used by the steel works in the manufacture of spiegeleisen and ferro-manganese. A cmoparatively small amount of the highest grade of commercial manganese ore is employed in the chemical industry. The Caucasian ore, which goes as high as 56 per cent. manganese, is used chiefly in the iron and steel industry, and is classed as high grade for this purpose. However, a higher grade is generally used in the chemical industry, where it is employed for the preparation of oxygen, bromine and iodine, in glass making and for coloring enamels, in dyeing and calico printing, for the preparation of potassium permanganate and other salts of manganese, as a drier for varnishes, etc. The chief consumers of the highest grade of manganese ore used to be the manufacturers of chlorine, but chlorine is now prepared generally by a different process. In California several hundreds of tons of high grade manganese ore are consumed annually for the preparation of chlorine at some metallurgical works, where gold is extracted by the chlorination process. As to the chief consumers of high grade manganese ore, see the manufacturing chemists and makers of speigeleisen and ferro-manganese who have advertisements in the "Engineering and Mining Journal."

PATENTS RELATING TO MINING AND METALLURGY.

UNITED STATES.

The following is a list of the patents relating to mining and metallurgy and kindred subjects issued by the United States Patent Office. A copy of the specifications of any of these will be mailed by the Scientific Publishing Company upon receipt of 25 cents.

Week Ending November 29th, 1898.

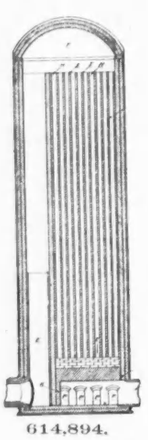
614,836. AIR AND GAS MIXER. Garret S. Chambers, Des Moines, Iowa. An air and gas mixing machine, comprising a mixing chamber suspended in atmospheric air under normal pressure and provided with ingress and egress ports for gaseous vapors and a valve-controlled ingress port for atmospheric air under pressure as great as or greater than the pressure of the gaseous vapors, the valve of the air-ingress port being controlled by the gravity of the gas in the chamber relative to the density of the atmospheric air in which the chamber is suspended.

614,839. METHOD OF FORMING ELECTRICAL CONNECTIONS. William B. Cleveland, Cleveland, Ohio. The method consists of: first, casting one member upon the other, heating the two contiguous surfaces to a welding heat while free from atmospheric contact; second, supporting the casting in a die to prevent distortion; and third, uniting the two members by application of pressure while they are at a welding temperature and free from contact of atmospheric air.

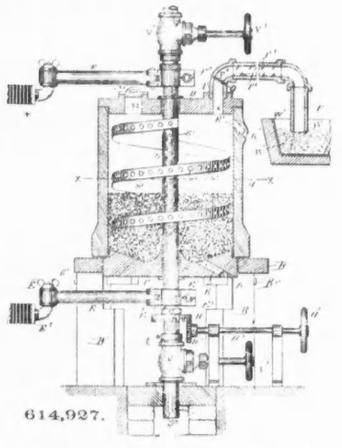
614,847. ENDLESS CONVEYER. Joseph Dick, Canton, Ohio. The combination of chain links having V-shaped extensions thereon, and engaging with substantially triangular-shaped carrier-slats, each slat having parallel short sides which extend at a right angle to the horizontal line drawn across the top of the slats.

614,852. PROCESS OF DEPHOSPHORIZING IRON. Samuel P. Etter, Birmingham, Ala. The process consists, first, in mixing the coke and crushed ore and a suitable quantity of finely-powdered dihydrate of aluminum and iron, placing in a blast-furnace and subjecting to smelting operation; second, adding to the upper part of the charge from time to time during said smelting operation, in any suitable manner, quantities of powdered dihydrate of aluminum and iron, whereby an anhydrous compound in a nascent state will be produced within the furnace in the presence of the vapor of phosphorus, thereby producing an active agent that will readily and quickly combine with the vapor of phosphorus in the furnace, and removing it from the iron, the operation being carried on under such conditions that the dephosphorization of the ore by the alumina dihydrate is effected before reduction of the iron therefrom.

614,894. HOT BLAST STOVE. Frank C. Roberts, Philadelphia, Pa. The combination of a system of checker-work located in the down-pass, a chimney flue extending across and under said checker-work, a wall or other device coinciding with the chimney flue and dividing the



614,894.



614,927.

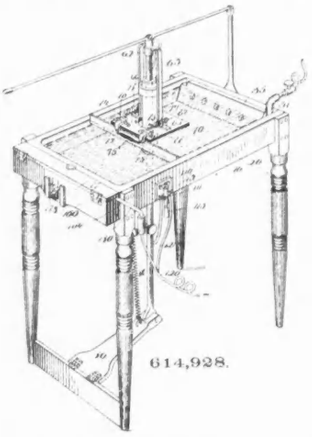
checker-work into two halves vertically, a series of openings in each side of the chimney-flue forming connections between the adjacent half of the checker-work and the chimney-flue, dampers placed in the openings and a device or devices for operating the dampers.

614,913. HOISTING, CONVEYING AND STORING APPARATUS. Samuel T. Wellman, John W. Seaver, and Charles H. Wellman, Cleveland, Ohio. Assignor to the Wellman-Seaver Engineering Company, same place. The combination with a storage-bin having girders forming the sides of a traveling crane, the girders forming the rail-bed for the crane, and including the storage-space.

614,926. EVAPORATING APPARATUS. Martin E. Brigham, Philadelphia, Pa. A vessel heated by a furnace and having a shaft with mixing blades attached passing through it, to keep the fluid or mixture constantly agitated.

614,927. PROCESS OF AND APPARATUS FOR SEPARATING METALS AND BY-PRODUCTS FROM ORES BY ELECTRICITY. Geo. D. Burton, Boston, Mass. The process consists in subjecting the ore under exclusion of air to an electric heat below the fusing-point of the metals for driving off the by-products, then admitting a gas containing oxygen, thereby causing combustion, and subjecting the ore to the combined heat of combustion and electricity at a temperature above the fusing-point of the metals and causing them to melt and leave the ore.

614,928. PROCESS OF TEMPERING METAL. George D. Burton, Boston, Mass. The process consists in subjecting it to the action of an

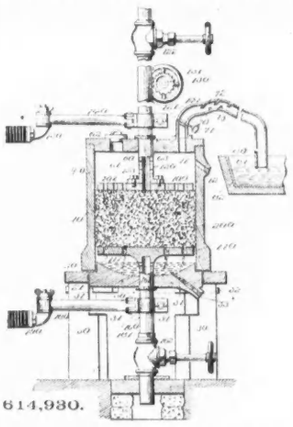


614,928.

electric arc sprung between it and an electrolytic bath, until the proper heat is obtained, then cutting off the current and permitting the article to cool in said bath, both the heating and cooling operations being performed without removing the metal from the bath.

614,930. PROCESS OF AND APPARATUS FOR SEPARATING METALS FROM ORES BY ELECTRICITY. George D. Burton, Boston,

Mass. The process consists in subjecting the whole mass of ore under treatment to pressure, and simultaneously to an electric cur-

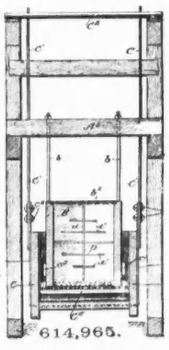


614,930.

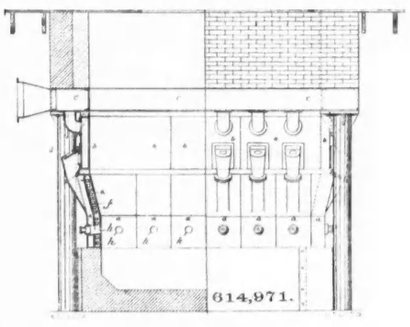
rent of high amperage and low voltage, and causing the pressure to follow the diminishing mass of ore during the operation.

614,940. **MINER'S DINNER-PAIL. John Elmgren, Starkville, Colo. A double** pail, the upper section being connected with the lower by a spring catch.

614,965. **AMALGAMATOR. James D. Maclay, Louisville, Ky.; Minnie H.** Maclay, administratrix of said James D. Maclay, deceased. The combination of a pivotally and adjustably suspended, oscillating



614,965.

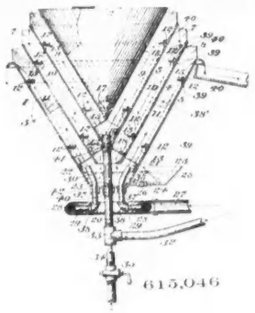


614,971.

mercury-trough, a feeding-block therein, the lower face whereof is in close proximity to the bottom of the mercury-trough and adapted to co-act therewith to rub or scour the ore, a vertical feed-passage in the block, and a frame composed of perforated bars adapted to catch the flour or float gold, in the passage.

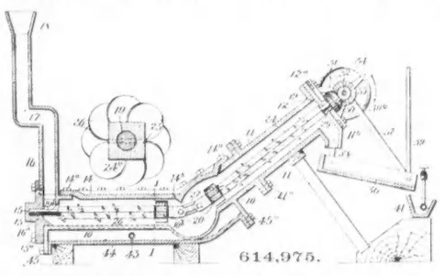
614,971. COOLING JACKET FOR BLAST FURNACES. John W. Nesmith, Denver, Colo. An air-jacket having a diaphragm dividing it into sections, openings through the diaphragm, means for forcing air therethrough in a series of jets, an upper jacket b and a conduit-girder located above the jacket b and in connection therewith, said girder being made hollow to form a passage for the air-blast.

615,046. AMALGAMATOR AND DISTRIBUTOR. Julio H. Rae, Philadelphia, Pa. This apparatus consists of a series of consecutively-in-



615,046

closed vessels, the innermost vessel being closed at its lower portion, rings supported upon the inner peripheries thereof, upwardly-extending plates supported upon said rings and subdividing the spaces between the vessels into separate passages, and means for



614,975.

forcing a supply of pulp and water through the passages, in combination with separate distributers.

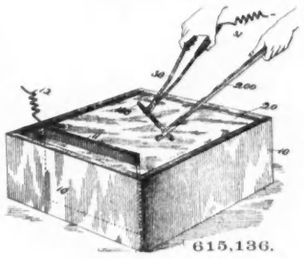
614,975. **AMALGAMATOR FOR GOLD SAVING. Louis C. Park, Vancouver,** Canada. Assignor to William W. Slater and James Galloway, Jr., Edinburgh, Scotland. In an amalgamator composed of sections of vertical, horizontal and sloping chambers, with the mouth of the vertical chamber placed at a distance above the sloping outlet and the horizontal chamber arranged on a lower plane than the said outlet, the combination of a lateral deviation 17 in the vertical chamber, a depending lip or projection 16a on the lower extremity of the said vertical portion and a detachable cover 14 on the horizontal portion having a depending part 14b at the junction of the obtuse angle.

614,995. **UNDERGROUND CONDUIT FOR ELECTRICAL CONDUCTORS.** Charles H. Sewall, Chicago, Ill. The combination with a body of material having a conduit or conduits inclosed therein, of an inclosing layer or sheath of insulating materials completely surrounding the body of material on the top, bottom and sides and effectively insulating the same from the earth to prevent the access of extraneous currents to the inclosed body of material.

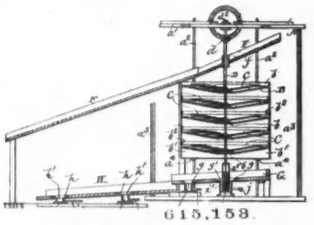
615,083. **DIAMOND-POLISHING TOOL. James W. Lyon, New York, N. Y.** In a diamond-polishing tool, members pivotally supported and having inner gem-clamping fingers, in combination with adjustable means for holding the members against opening.

615,100. **CARBURETER. Elijah D. Parrott, Golden Dale, Wash. An ap**paratus for manufacturing gas, comprising a gasolene-supply pipe, an air-supply pipe connecting with the gasolene supply pipe, means for heating the pipes at the junction, a coil connected at one end with the supply pipe, an air-pump connected with the other end of the coil, and a gasometer into which the air-pump discharges.

615,136. **ELECTRIC METAL-HEATING PROCESS. George D. Burton, Bos**ton, Mass. The process consists in subjecting the parts to be heat-



615,136.

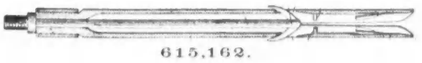


615,153.

ed while in contact with each other to the action of an electric arc sprung between them and an electrolytic bath.

615,153. **GOLD SEPARATOR. Amos T. Fox, Sumner, Wash. The combina**tion with a series of amalgamating-bowls, of a shaft for supporting and rotating some of the bowls, a sluice-box for receiving the discharge from the bowls, mercury-cups formed in the sluice-box, a bearing mounted in one of said mercury-cups for supporting the lower end of the shaft, a sleeve formed upon the bearing and extending a considerable distance above the same, an inclosing sleeve secured to the shaft and adapted to extend around the first-mentioned sleeve and the bearing, the construction being such that the mercury in the cup and the dirt or other substances discharged from the bowls will be excluded from said bearing.

615,162. **OIL WELL FISHING TOOL. Robert D. Green, Cyclone, Pa. A** rod comprising a socket, slit longitudinally, having engaging members at its lower end, an elevating-rod passing within the socket

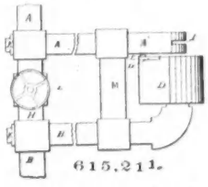


615,162.

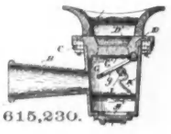
and having inclined arms, the two parts of the socket having openings through which the arms pass whereby an upward pull upon the elevating-rod will draw the socket together around the article to be removed.

615,172. **PRIMARY BATTERY. Henry K. Hess, Philadelphia, Pa. The com**bination of a series of partitions formed of frames of conducting metal acting as one terminal of the battery and supporting sheets of porous material, the partitions forming chambers, the alternate chambers being for the reception of the depolarizing agent, the other chambers being for the reception of the exciting fluid and zinc electrodes.

615,211. **HYDROCARBON BURNER. James P. Call, Redondo, Cal. A bur**ner, comprising the steam-supply pipe, A, an oil-supply pipe, B, the



615,211.

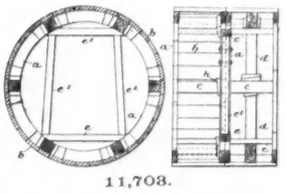


615,230.

steam-pipe, A, having nozzle, A', with steam-discharge port, I, and oil-supply pipe, B, with the oil-discharge chamber, D, the oil-discharge chamber, D, having adjustable plate, D', mounted in the top of said chamber, and the adjustable plate, D'.

615,230. TUYERE IRON. John Clark, Liberty, Ind. An improved tuyere iron comprising a damper for the blast-outlet, an actuating member therefor, and a yielding member between and arranged to hold the damper closed by the movement of the actuating member.

REISSUE.—11,703. **WALL OR LINING FOR SHIELD TUNNELING. George** H. Dunlop, South Melbourne, Victoria. Original No. 595,702, dated



11,703.

December 21st, 1897. A wooden wall or lining for tunneling and for shaft-sinking, composed of ribs as a and laggings as b and struts as c having a strengthening set as e, e', e^2, longitudinal pieces as f, all secured together.

PERSONAL.

Mr. Edward Dittman, a Mexican mine owner, is in San Francisco.

Mr. George Kislingbury has returned to Utah from British Columbia.

Captain J. R. De La Mar will remain in the West till Christmas, and will devote most of his time to Utah.

Mr. Richard A. Parker, connected with the California Exploration Company of San Francisco, is in Arizona.

Mr. John E. Rothwell, mining engineer of Denver, Colo., has gone to the Black Hills on professional business.

Dr. George W. Maynard, a New York mining engineer, is in California in the interest of a foreign mining syndicate.

Mr. W. Kreugel, of Detroit, Mich., is in Central City, Colo., to look after his interests in the Alpha Gold Mining Company.

Mr. Fred Beaudry, formerly a successful mine operator in Colorado, is now interested in placer mines in Trinity County, Cal.

Mr. Charles N. Chowder, of Aspen, has been appointed Deputy Commissioner of Mines of Colorado, in place of Mr. L. N. White, resigned.

Mr. James Shirley, mining engineer, formerly of Prescott, Arizona, is now in New York, having just returned from a prolonged stay in Mexico.

Mr. W. B. Devereux arrived in Salt Lake City from the Mother Lode, California, a week ago. He is devoting some 10 days to Utah and Montana.

Mr. Oscar Szontagh returned to Salt Lake City from Idaho last week. He has been investigating some gold properties in the neighborhood of Boise.

Mr. John W. Gates, of Chicago, has resigned his position as president of the Illinois Steel Company. He will, it is said, go on an extended trip to Europe.

Mr. Hermann A. Keller is again at his Salt Lake City office, arriving from San Francisco several days since. Hereafter his headquarters will be in that city.

Mr. Richard M. Jessup, of New York, has accepted a position with the Gold Coin Mines Company and Gregory Consolidated Mines Company, Gilpin County, Colo.

Mr. S. H. Brockunier, general manager of the Virginia Mining Company of Ontario, Limited, that has property in the Rainy River District, is visiting New York.

Mr. Frank P. Swindler is again in Salt Lake City, returning 10 days ago from a trip to Arizona and California, where he investigated several mining propositions.

Mr. Victor M. Clement, who has just been appointed general manager of Captain De La Mar's mining undertakings, will have his headquarters at Salt Lake City.

Mr. Hartwig A. Cohen, who has recently resigned the general management of Captain J. R. De La Mar's mining enterprises, is in New York, where he has opened an office as mining engineer.

Mr. George A. Packard is in Boston. Since severing his connection with the Boston & Mercur Company he has been examining properties in Utah and Montana, and his eastern trip is on this business.

Mr. Thomas F. Coles, of Ironwood, Mich., who is at present in charge of the Oliver Mining Company's interests in the Gogebic Range, has been made superintendent of the Consolidated Copper Company's properties in Keweenaw County.

Mr. Jacob Bamberger has returned to Utah after a visit East. In New York and Cincinnati he found more keen interest taken in precious metal mining than for a long period.

Mr. Frank Nicholson, having completed his engagement as general manager of the Consolidated Gold Fields of Mexico, Limited, at Santa Elena, Mexico, has returned to New York, where he will establish an office as consulting mining engineer and metallurgist.

Mr. Samuel Newhouse has been in New York for 10 days and is now on his way westward. He will spend most of his time this winter in Salt Lake City hastening forward the construction of the Highland Bay smelter and watching the further exploration of the Highland Bay mine.

Mr. T. H. Oxnam, manager of the De La Mar Mine, at De La Mar, Nevada, spent several days recently at Salt Lake City. He has returned to Nevada. He reports that the cyaniding plant under his charge is treating 9,000 tons per month and that everything at the great mine is running smoothly.

OBITUARY.

Andrew Allen, superintendent of mining engineers of the Pennsylvania Coal Company, died at Pittston, Pa., on December 9th from burns caused by an explosion of gas in No. 4 mine on December 6th.

Henry M. Platt, who is said to have been the pioneer gold and silver refiner of the United States, died at his home in New York December 8th, aged 76 years. He was born in New York, educated in the city schools, and studied chemistry in France. He established his gold and silver refinery in New York in 1849, and handled bullion from all parts of the country. He retired from active business in 1881.

John T. Gause, president of the Harlan & Hollingsworth Company, Wilmington, Del., died December 1st. He was born in Chester County, Pa., in 1823. In 1843, when 20 years of age, he went to Wilmington and secured a position as office boy in the works of Harlan & Hollingsworth, then a small concern. From that position he steadily advanced until he became president of the great ship and car building corporation.

William B. Noble, a Pacific Coast pioneer, died at Idaho City, Idaho, December 3d. He was born in Harrisburg, Ky., April, 1824. In 1849 he went to Siskiyou County, Cal., and from that State to Northern Idaho in 1861. He first went to the Oro Fino placer, and in the fall of 1861 went to Florence. In the fall of 1862, shortly after the discovery of the famous placers in Idaho County, he came over from Florence. His party located ground and water rights, mining extensively about Idaho City, as the Buena Vista Bar Company. All of its members became wealthy. Noble lost nearly all of his wealth in business ventures.

George H. Parrish, one of the oldest anthracite operators in this company, died at Scranton, Pa., recently, after a long illness. He was born in Wilkes-Barre, May 15th, 1819. When a young man he learned his trade as a mechanical engineer in Paterson, N. J., and then went West as a railroad and bridge contractor. He returned to Wilkes-Barre in the early sixties and became interested in the coal industry. He and his brother, the late Charles H. Parrish, may be said to have been the pioneers of the anthracite industry in Wyoming Valley. For many years Mr. Parrish was general superintendent of the Lehigh & Wilkes-Barre Coal Company.

Sir William Anderson, director general of the Royal Ordnance Factories, died in London December 11th, aged 63 years. He was born of British parents at St. Petersburg, Russia. From 1855 to 1864 he lived in Dublin, engaged chiefly in the construction of bridges, cranes and signals for railways. In 1864 he removed to London, joining the firm of Easton & Amos, and built the great Erith Iron Works on the Thames. In 1889 he was appointed director general of the Royal Ordnance Factories, which comprise the laboratory, the carriage departments and the gun factory at the Royal Arsenal, Woolwich, and the gunpowder factory at Waltham Abbey and the small arms factories at Enfield and Birmingham.

SOCIETIES AND TECHNICAL SCHOOLS.

Lehigh University.—The university has published in pamphlet form "Origins and Destiny," an address delivered on "Founders' Day," October 13th, 1898, by Langdon C. Stewardson.

Montana Society of Engineers.—At the November meeting of the society Mr. William Braden was elected to membership. The bill providing for the appointment of a State engineer and defining his duties was then read, section by section, and discussed, after which Mr. O. Jackson, recently from Alaska, addressed the society upon railway, tramway and other improvements now being made in that country. Owing to a lack of time the reading of the paper by F. W. Blackford upon the Butte-Centerville Electric Railway was postponed until the December meeting.

American Institute of Mining Engineers.—The 29th annual meeting will be held in New York City, beginning Tuesday, February 21st, 1899. The hotel headquarters will be at the Murray Hill Hotel, and sessions will be held at the hall of the American Society of Mechanical Engineers. It is expected that arrangements will be made to visit a number of the large mines, smelters and furnaces within easy reach of New York. Members desiring to present papers or remarks are requested to notify the secretary, 13 Burling slip, New York.

A special topic of discussion will be the paper on "The Evolution of Mine-Surveying Instruments," by Dunbar D. Scott, Ironwood, Mich. This important paper surveys the history of mine surveying, describing, illustrating and criticising the successive types of apparatus employed in this and other countries.

American Chemical Society.—The eighteenth general meeting of the society will be held in New York City December 27th and 28th, at the house of the Chemists' Club at 108 West Fifty-fifth street. At the opening session addresses of welcome are expected from Hon. Randolph Guggenheimer, President of the Council of the City of New York, and President Alexander S. Webb of the College of the City of New York, followed by a response by Prof. Charles E. Munroe, president of the society. The remainder of the morning session will be devoted to reading papers. At the close of the session the members will proceed immediately to Newark, N. J., where luncheon will be provided by the New Jersey Zinc Company. The afternoon will be spent in visiting the works of the company and other places of interest in the vicinity. At 8 p. m. the society will meet at the Chemists' Club house to listen to the reports of officers and committees, and to the address of the retiring president. The council of the society will hold a meeting at the close of the president's address.

On December 28th the morning session will be held in Havemeyer Hall, Columbia University, from 10 a. m. to 1 p. m. After luncheon at the University the chemists will visit the laboratories of Havemeyer Hall, the library of the University and other points of interest in the city. From 5 to 6 p. m. a demonstration of the manufacture and properties of liquid air will be given by Mr. Tripler. At 7 p. m. a banquet will be served, at which the visiting chemists will be guests of the New York Section.

Engineers' Club of St. Louis.—At the annual meeting on December 7th 34 members were present. Mr. Mark Barry was elected a member.

Reports were read from the secretary, treasurer, librarian, Board of Managers of the Association of Engineering Societies, Entertainment Committee and Executive Committee. The report of the treasurer was referred to the Executive Committee for verification, and the other reports were ordered to be received and filed. As the Committee on Standard Gauges for Thickness had no report to make, this committee was honorably discharged. The Committee on Nominations reported the nominations for officers for 1899.

The paper of the evening was by Mr. A. H. Zeller. The author was a delegate from the Engineers' Club of St. Louis to the celebration of the fiftieth anniversary of the civil engineers of France, and the paper described the manner in which the event was celebrated. He gave an account of the excursions on which the visitors were taken and described the works of engineering interest which were visited. After the reading of the paper a number of lantern slides were exhibited showing views of engineering works in Paris, Berlin and other European cities.

A motion was passed that the club make acknowledgment for the handsome manner in which the delegates were entertained and that the thanks of the club be extended to the delegates for their services in the celebration.

Engineers' Club of Philadelphia.—At the meeting on December 3d nominations for officers for the ensuing year were presented and various by-laws discussed. The paper of the evening was by Mr. R. W. Lesley on "Cement and Cement Testing Laboratories." He called attention to the fact that cement is made in one place and tested at another, and the article tested is the cement which leaves the mill, the water which is used by the tester, the sand which is used by the tester and the personal equation of the tester plus the personal equation of his laboratory in combination.

The paper showed some 30 or 40 possible causes whereby this manufactured test-piece may be injured during the process of its preparation or by its treatment thereafter and before it is tested. This was illustrated by a table prepared by Prof. J. Madison Porter, showing different treatments and results obtained upon a single sample of cement in 9 different scientific laboratories.

The evolution of the testing machine for determining tensile strength was shown by slides, picturing the original machine used by John Grant on the London drainage as well as the modern forms now in use.

After drawing the clear distinction between the well-equipped, skilfully-operated and technically perfect laboratories of the European governments as well as of some of the American public and private laboratories, and the ordinary testing laboratory in use on the field and on the work in most of the great American engineering constructions where conditions do not admit of the same elaborate equipment and delicacy of manipulation as are found in the first-mentioned class of testing laboratories, the writer said that there was but one answer as to how cement shall be tested, and that is that

there shall be distinct differences made between the specification for cement to be tested in the ordinary laboratory on public work and cement to be tested in the perfectly equipped laboratory of the skilled expert. This difference is plainly stated in the specifications of the Master Builders' Exchange, Philadelphia, Pa., and in that of the Russian Government.

INDUSTRIAL NOTES.

The Colorado Iron Works Company of Denver, Colo, has an order for 6 slag cars for the Copper Queen Mining Company, Bisbee, Ariz.

The National Tube Works Company, of McKeesport, Pa., has declared a regular dividend of $1.75 on the preferred stock, payable January 2d.

The Nordberg Manufacturing Company of Milwaukee, Mich., has been awarded a contract for 8,000,000-gallon pump for the Sheboygan, Mich., Water Company.

The Baltimore & Ohio receivers have given the Schoen Pressed Steel Company of Allegheny, Pa., an order for 1,000 pressed steel cars, with a capacity of 50 net tons each.

The St. Louis Foundry Company, St. Louis, Mo., recently shipped a complete running outfit, consisting of boiler, engine crusher and all accesories to Las Charcos, Mexico.

The Denver Boiler and Sheet Iron Works Company is making a second shipment of 12 cars to the Gilpin Tramway Company on an order for 50 cars placed a short time ago.

John Johnson & Company, of New York City, manufacturers of filter presses for treating gold slimes, etc., have received a big order from a well-known Western gold mining company for filter presses for use in a cyanide plant.

Adam Cook's Sons, New York City, proprietors of the Albany lubricating compound, are having numerous orders from mills and mining plants. The firm sends a sample for trial to any one having trouble with hot bearings or journals.

The Berlin Iron Bridge Company, of East Berlin, Conn., has recently built for the town of Newport, Herkimer County, N. Y., a bridge having two spans of about 70 ft. each. This bridge is of the parabolic type, with steel floor beams and stringers.

The Risdon Iron and Locomotive Works of San Francisco, Cal., is to build for Mr. Brice M. Glasgow a large placer dredge to use in his gold property in Dutch Guiana. Mr. Glasgow has been examining placer plants in the West for several weeks.

The Read Phosphate Company has opened its new fertilizer plant in Nashville, Tenn. It has also a plant at Charleston, S. C., and makes special grades of fertilizers, beside importing and keeping for sale nitrate of soda, kainit, sylvinit, muriate and sulphate of potash.

The Truax Manufacturing Company of Denver has established a branch plant in San Francisco for manufacturing its ore cars. These are in great demand on the Pacific Coast, and the new plant fitted with the latest machinery will enable the company to supply this demand.

The Morton Manufacturing Company of Muskegon, Mich., has a number of European contracts for ship and engine building tools. Among other orders is one from John Brown & Co. of Sheffield for a shaper to weigh from 16 to 20 tons. It is to be used for planing armor plate.

The American Colonial Trading Company, of New York, has been incorporated, with a capital of $1,000,000, for the purpose of representing American and English manufacturers in our newly acquired territory. They will have branches in all the important cities in Cuba and the Philippine Islands.

The Canadian Oil and Coal Company, Limited, has applied for a Dominion charter to locate and develop petroleum wells and coal mines. The chief place of business is Montreal; capital, $1,000,000. Incorporators: W. Strachan, J. W. Pyke, B. Shepherd, G. H. Meldrum, Montreal, A. W. Cole, Albany, N. Y.

The 3 Eliza furnaces of Laughlin & Company, Limited, of Pittsburg, when rebuilt will have stacks 105 ft. high, with 24 ft. boshes. They will each have 16 tuyeres with bronze cooling plates. A fourth furnace, 100 ft. high and 24 ft. diameter, will probably be added. The combined daily output of the four is expected to be 2,400 tons of pig.

The Westinghouse Electric and Manufacturing Company, of Pittsburg, has closed a contract with the Hanover Strassenbahn-Aktien-Gesellschaft, of Hanover, Germany, for 101 large electric motors and 125 controllers for use on its street cars. The success of American machines abroad brought this order, in spite of violent competition from German manufacturers.

A. Middlebrook, manager of the Denver office of the Jeanesville (Pa.) Iron Works Company, has recently sold the Colorado Fuel and Iron Company for its mine at Walsenburgh an 8 by 12 in. electric power pump; the Banker Mining Company, of Leadville, a duplex station pump to lift water 100 ft., and the Penn Mining Company a station pump. He reports the company's shops very busy at mine pump work.

The Pittsburg Reduction Company of Pittsburg, Pa., has received an order for 25 miles of telephone wire for Manila, with which it is proposed to build a line connecting the city with Cavite. The company has secured also an order for 150 miles of wire, weighing 200,000 lbs. for the Standard Electric Company, of San Francisco, to be used in carrying electric power from water falls in the Cascade Mountains to San Francisco.

The Tropenas steel process is about to be adopted by the Union Iron Works, of San Francisco. A large foundry is being built, in which will be placed two 2-ton Tropenas converters. Mr. Irving M. Scott, vice-president and general manager of the company, recently made a thorough investigation of the process in operation in Europe. Messrs. Powell & Colné, New York City, are the agents for the process in the United States.

The Mine and Smelter Supply Company of Denver has lately sold 35 electric hoisters to the Colorado Electric Power Company, ranging from 5 to 30 H. P. A number of these have already been placed on mines in the Cripple Creek district. A 300 H P. electric hoister is in course of construction for the large plant of the Smith-Moffat combination at Goldfield, and the construction of one 200 H. P. and two 100 H. P. hoisters is under contemplation.

It is stated that the Cambria Steel Company has leased the plant of the Cumberland Rolling Mill, owned by the Baltimore & Ohio Railroad Company, at Cumberland, Md. The plant was built in 1870 as an iron mill, and a bar mill was added later. It contains 3 single and 15 double puddling furnaces, 16 heating furnaces, 8 trains of rolls and 2 hammers, the product being bar iron, beams and channels, flange and refined plate, spikes, fish plates, angles and tees, the annual capacity being 2,600 gross tons. The Cambria Steel Company will make extensive improvements.

The Keystone Driller, manufactured by the Keystone Driller Company at Beaver Falls, Pa., has been used at several points in the West in testing placer ground. The North American Dredging Company at Breckinridge, Colo., has used one this summer in locating bedrock. It is said that a party of Eastern men are exploring the sand bars along the Colorado River in Utah with a Keystone drilling machine upon a flat boat, sinking 9 and 8-in. pipes to bedrock. By means of a vacuum sand pump the sand and gravel containing the gold is lifted and washed. It requires one to two days to sink to bedrock, 30 to 50 ft. The pipe is then withdrawn and used again.

The Robinson-Rea Manufacturing Company and the Leechburg, Pa., Foundry and Machine Company, have consolidated under the name of the Mesta Machine Company. The officers are: George Mesta, president; W. H. Rea, secretary; J. O. Horning, treasurer. The business headquarters will be in Pittsburg. The Mesta Company has purchased a tract of land containing about 10 acres near Homestead, which will be a large plant for manufacturing sand, chill and steel rolls, machine mold steel gear, machinery for rolling mills, steel works and a general line of steel castings; also an ingot mold foundry, which is to have a capacity of 150 tons per day. It is believed that the new company will build Corliss engines and pumping machinery.

Joseph Edwards & Company, of New York City, issue several catalogues and pamphlets describing the centrifugal pumps they manufacture. Catalogue No. 12 tells about the "cataract," which is made in sizes to handle 200 to 60,000 gallons per minute. Besides its suitability for draining clay pits, phosphate beds, shallow iron mines, it can be used for placer mining, for irrigation work or for pumping coal from sunken vessels. Catalogue No. 11 describes the "Anti-Friction" pump. This pump has been in successful use for over 40 years. In its improved form it is recommended for general drainage work, being made in sizes to handle 150 to 1,500 gal. per minute. The pressure pump of this type will, it is said, handle water against a head of 100 ft.

TRADE CATALOGUES.

A very handy catalogue of convenient size for the pocket is issued by the Crane Company of Chicago. It contains 443 pages, has a durable cloth binding and a good index. The Crane Company manufactures a great variety of brass and cast iron valves and cocks, as well as malleable and cast iron steam and gas fittings. The firm also makes a specialty of hydraulic valves and fittings for pressures from 800 to 2,000 lbs. Oil cups, gauges, asbestos materials, steam and gas fitters' tools, injectors, etc., are also illustrated and prices given. The catalogue ends with some handy tables and some condensed information of use to pipe fitters in general.

The Connersville Blower Company of Connersville, Ind., publishes an attractive pamphlet describing the "cycloidal" form of rotary blowers, pumps and water motors that it manufactures. The pamphlet presents clearly and forcibly the claims of the company for the superiority of some of the merits claimed are due to the ring oiling, adjustable quarter box journal bearing, which device is fully illustrated and described. Testimonials are given from some of the best-known smelters in this country. The rotary pumps made by the company are recommended for lifts of 10 to 200 ft. and are made from 1,000 to 50,000 gal. per minute capacity. The company's rotary cycloidal blower, for use in smelting furnaces, as compared with fans or blowing engines, claiming that it is more economical at from 8 oz. to 5 lb. pressure, is simple in construction, positive in action, can be regulated according to the work to be done, and is not likely to get out of order. Water motors, it is claimed, are adapted to heads of 300 ft. or less, are easily installed and give high efficiency. The pamphlet is to be commended for the excellence of the illustrations.

MACHINERY AND SUPPLIES WANTED.

If any one wanting machinery or supplies of any kind will notify the "Engineering and Mining Journal" what he needs he will be put in communication with the best manufacturers of the same.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning goods of any kind and forward them catalogues and discounts of manufacturers in each line.

All these services are rendered gratuitously in the interest of our subscribers and advertisers; the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, nor have they any pecuniary interest in buying and selling goods of any kind.

GENERAL MINING NEWS.

Oil Exports.—The Bureau of Statistics reports the exports of mineral oils from the United States during November as follows: Crude, 8,722,732 gals.; naphtha, 2,301,847 gals.; illuminating, 58,260,048 gals.; lubricating, 5,106,845 gals.; residuum, 1,616,218 gals.; total, 76,007,690 gals., against 82,676,014 gals. in November, 1897. The exports for the 11 months ending November 30th, 1897, amounted to 920,610,561 gals., against 903,505,854 gals. in 1897.

ARIZONA.

Pima County.

(From an Occasional Correspondent.)

Old Boot Mine.—A 30-ton water-jacket furnace has been put up at this mine, near Silver Bell. It is now turning out from 2 to 2½ tons of high-grade matte daily, with some copper. The product is shipped to New York for refining. Mr. C. S. Nielson is in charge, and erected the furnace.

CALIFORNIA.

Amador County.

(From Our Special Correspondent.)

Zella.—Sinking at this mine in Jackson still continues, and if satisfactory ore is not encountered in the lower levels work will be resumed on the upper levels. The reserves in this mine are said to be large.

Fresno County.

(From Our Special Correspondent.)

Heiskell.—At this copper mine, 7 miles from Fresno, which has been worked in a desultory manner for some years, a strike has been made by L. Beard, J. C. Williams and the Burton Brothers. The old tunnel had been cleaned out and 4 shafts sunk to a depth of 100 ft. The ore body was developed in the levels run on the 40 and 80 ft. Assays are said to give over 50% copper. Arrangements are being made to develop the property on a large scale.

Kern County.

(From Our Special Correspondent.)

Black Hawk.—50 tons of ore from this mine, near Randsburg, are being shipped to the Cuddeback Mill. About 5 tons of ore per day are being taken out.

Hard Cash.—At this mine the new mill has been completed and has been started up. The shaft has reached a depth of 100 ft. and a drift run south about 100 ft. in good ore. Substantial buildings have been erected.

Mariposa County.

(From Our Special Correspondent.)

Columbus Mining Company.—This company has been organized to develop a group of claims comprising the La Fayette, Eureka No. 2 and several others. Some of the claims have been worked to a depth of 150 ft.

Nevada County.

(From Our Special Correspondent.)

South Fork.—This mine, near Graniteville, which has been under bond to the Netherland Company, has reverted to the owners, S. Fowler and J. E. Miller, who have paid off the liens and will probably resume work on the property in the spring. The Netherlands Company erected a mill on the property and did considerable development work.

Plumas County.

(From Our Special Correspondent.)

La Porte Gold Mining Company.—At this hydraulic mine the restraining dam on Rabbitt Creek, 40 ft. high, located near the town of La Porte, has been completed and extensive work will begin soon.

San Bernardino County.

(From Our Special Correspondent.)

Copper City Camp.—The mines in this district, 30 miles east of Johnnesburg, are being developed by a New York syndicate, who have a large force of men employed.

Sierra County.

(From Our Special Correspondent.)

Gold Bluff.—The ditch and flume at this mine, 2 miles northeast of Downieville, has been completed, and the mine is being stocked up with supplies for the winter. A second air compressor has also been received. The 20-stamp mill is running full time, and the lower levels are being developed.

Tuolumne County.

(From Our Special Correspondent.)

Confidence.—This property, 13 miles northeast of Sonora, comprising the Independence, Little Jessie and Plowboy claims, owned by a prominent implement firm of San Francisco, is reported to be paying well. The canvas plant has been completed and will be in operation soon.

Dewey, Schley and Sampson.—These claims on the East Belt, between the Kanaka and Buchanan mines, on the main Tuolumne River, have been consolidated and will be worked by a company composed of C. S. Young, John Moss, E. P. Barrett, H. S. Allen and George Beaudet. The ledge is said to average 6 ft. of high-grade ore.

Excelsior.—The new shaft at this mine, 2½ miles northeast of the Confidence mine, about 15 miles from Sonora, is down 140 ft. The vein will probably be cut within the next 100 ft. without cross-cutting. The ore taken from the old workings years ago milled $60 per ton.

COLORADO.

Aspen County.

Smuggler.—The old mill, according to the Aspen "Times," is running one 11-hour shift, and producing 20 tons of concentrates from 140 tons of ore daily. The new mill to treat the low grade ore, which runs about 10 oz. silver, 10% lead and 25% carbonate of zinc is running; 100 tons of this zinc ore are treated in this mill every 24 hours, with only 7 men employed on both shifts. After the ore passes through the big crusher 3 Chilian mills pulverize it to sufficient fineness to be handled and separated by the 12 Hallett zinc tables, which are much like the Willley tables. The product is 10 tons a day, that will run 65% lead and 40 to 45 oz. silver and is worth about $500 per ton. The zinc product is worth about $12 a ton, but as it carries some silver, this product is being piled up for future negotiations. It costs about $1, according to report, to break and hoist the ore, and less than 50c. a ton to concentrate it.

Boulder County.

Boulder.—This mine, at Caribou, has 20 men working a 4-ft. vein. The new 50-ton mill at Cardinal is nearly completed.

Monte Carlo.—On this Caribou property, now leased by Colorado Springs parties, a new hoist is in place and the shaft is being sunk.

Shoshone.—This Caribou mine, now owned by Mr. Doyle of Cripple Creek, is being developed rapidly.

El Paso County—Cripple Creek.

Moon Anchor Gold Mining Company.—This company recently bought from the Denver branch of the Jeanesville Iron Works Company an 8¼ by 18 in. electric power pump, a No. 9 B sinking pump, 14 by 13 in., and 650 ft. of 10-in. column pipe and fittings.

(From Our Special Correspondent.)

November Output.—The November output of the district amounted to 32,793 tons of ore of the total value of $1,204,398. Of this, 7,995 tons of the average value of about $70 per ton, making $559,650, were sent to the smelters, and 24,798 tons of the average value of $26 per ton, making $644,748, were sent to the chemical mills. A small amount of ore was handled by the stamp mills, but not enough to make any material difference in the monthly output. The November output did not quite come to expectations, as it fell a little short in the amount of smelting ore produced.

The principal dividends paid by the public stock companies were as follows: Portland, $60,000; Elkton Consolidated, $20,000; Gold Coin, $10,000; Anchoria-Leland, $6,000; Moon-Anchor, $45,000; Montreal, $7,500. Total, $148,500. This does not include a number of properties owned by private individuals, and close corporations, such as the Strong, Independence, Modoc, Golden Cycle and others. The Moon-Anchor was a quarterly dividend.

Blue Bell.—The annual meeting of this company was held this week in Colorado Springs, and the following directors elected: Marion Langford, J. Ducey, William Barber, Geo. Carr and J. E. Handbury. A proposition was made to the company by Clarence Edsall to lease the Hobo claim of the company for a term of four years, and agreed to drive a tunnel in to the property from an adjoining claim to cut it a depth of 400 ft., and to pay a royalty of 20% on all ores shipped. The proposition was taken under consideration.

Elkton Consolidated Mining and Milling Company.—At a meeting of the directors of this company it was decided to pass the usual monthly dividend for the month of December. It is understood that the mine is in very good physical condition, and that money enough was made during the month of November to pay the usual 2c. dividend, but on account of the recent purchases made by this company it was deemed wiser to forego the dividend. It was also decided at the meeting that beginning with January 1st, 1899, the dividends will be paid quarterly.

Findley Gold Mining Company.—The annual meeting of this company was held this week, and the following directors elected: Geo. E. Lindley, president; G. R. Buckman, vice-president; A. T. Jones, secretary and treasurer; W. A. Otis, W. B. Milliken, J. T. Milliken and H. M. Blackmer. J. T. Milliken is a St. Louis man who has recently bought considerable stock. The president's report gave a bright future. The property is at present worked by lessees, some of whom are shipping ore. The claim is situated next to the Hull City placer, and has some of the extension of its rich vein.

Matoa Gold Mining Company.—This company has entered the list of dividend payers, having declared one of 2½c. per share, making a total of $25,000 to be distributed among the stockholders. The money to pay the dividend was derived from royalties received from the Johnson lease on the Half Moon claim, one of the company's Gold Hill properties.

Monument Gold Mining Company.—It was recently announced that this company had been incorporated with a capital stock of 3,000,000 shares of the par value of $1 per share. It should have been 300,000 shares of the par value of $1 per share. The shaft is now about 350 ft. deep. E. E. Everett is in charge.

Portland Gold Mining Company.—This company is sinking a new working shaft some distance from the Burns shaft. The new shaft is on the Captain claim, and is 5 by 15 ft. in the clear.

Gilpin County.

(From Our Special Correspondent.)

Ore Shipments.—During November the county shipments of smelting ores and tailings or concentrates amounted to 4,788 tons. As compared with November, 1897, this is a decrease of 252 tons, due to the Gilpin Tramway Company's failing to provide cars for the big shippers, and also to the heavy snows of the closing week. This month ought to be the biggest of the year, but for the first 10 days some of the mines have scarcely any cars, and without a material change their output will be again curtailed. The Concrete produced 1,325 tons, or 350 tons short of its regular production. The Kansas-Burroughs Consolidated Mining Company had an output of 2,675 tons, just 700 tons short, account of Tramway, and the above are only a sample of the decreased productions of the county for November month.

American Uranium Mining Company.—This company, with a capital stock of $100,000, has been incorporated to operate in Gilpin County. The principal offices are in New York City and Central City. The directors for the first year are Henry M. Valentine, A. Berton Reed and James A. Gregg.

Cook.—Sinking is in progress on the 100-ft. contract to reach the 700-ft. level, a present depth of 625 having been reached. The daily production is 120 tons of mill ore, and the smelting ore runs from 3 to 5 tons per day. The Mammoth vein has been cut on the 600 west level, and there is a good body of smelting ore. The working force is now 130 men. K. Colvin is manager for the Boston owners.

Fisk.—An average force of 60 men is employed, and the daily shipments of mill ore reach 50 tons, averaging $11 per ton. The smelting ore averages from $75 to $100 per ton, the last carload lot giving net returns of $149 per ton.

Gold Collar.—Massachusetts parties are interested in this property, which is doing well, under the management of L. H. Stockbridge. The mill ore runs from 5 to 7 oz. gold per cord, and the last smelting ore gave net returns of $135 per ton.

Topeka.—Manager Lowe has received returns from 8 tons, showing values of 41 oz. gold per ton, and a check for $4,344 from the State Ore Sampling Works for 4 tons of another lot. The mill production last month was 95 cords, giving average values of 5 oz. gold per cord, and the total production was about $16,000. The Topeka is to-day, perhaps, the best paying proposition in the county.

Wood.—A shipment of uranium ore was made this week of 52 sacks, or a little over 2 tons, by Charles Poulot, to Denver.

Lake County.

(From Our Special Correspondent.)

Big Six.—It is learned that the new lessee of the Nettie Morgan property has in his lease contract a purchase option. It is the intention to explore the lower levels by a new shaft. The lessee has an option, it is understood, for over half the stock, the figures being something like 17c. per share.

Ibex Mining Company.—The heavy snow cut off shipments but a few days, and now ore is being sent down the new Denver & Rio Grande branch as fast as cars can be secured. Development work is prosecuted with excellent results, and shipments are over 8,000 tons per month.

Leadville Ore Output.—The output is now averaging 2,000 tons per day. Recent snows kept back shipments for a week, but now the new railroad branches as well as the ore teams are busy. At both smelters the furnaces are running full blast and have all they can do.

Nisi Prius Leasing Company.—Pumping operations have begun on the Crown Point shaft. As soon as the water is out the first contact is to be explored.

Weston Pass Section.—Despite heavy snow there is much activity on the Ruby and surrounding claims, which are prepared to work all winter. Mr. Henney, of Freeport, Ill., the owner of the Ruby, has the ore hauled on sleighs. Shipments have run up to 50 tons daily, while a force of 30 men is pushing exploration work.

FLORIDA.

Phosphate Industry.—The Juliette Phosphate Mining Company has awarded contract to McLanahan & Stone, of Hollidaysburg, Pa., for the installation of a complete phosphate mining and washing plant, including elevators, driers, distributing screens, washer logs, etc. The Victoria Phosphate Company will also erect a large crusher.

IDAHO.

Idaho County.

Buffalo Hump District.—Considerable development work will be carried on all Winter in this new district. On the Jumbo a cross-cut tunnel has cut the vein.

Good Enough.—At this Warrens mine 15 men are employed under H. Matthews, superintendent. The 10-stamp mill is running steadily.

Morning Star.—This group of claims on Rabbit Creek caused the recent rush of would-be locators from Florence. Most work in the new locality is suspended till Spring on account of deep snow. Samples from surface croppings of the Morning Star show fair values in free gold.

Kootenay County.

Boulder Canyon Mining Company.—This company has been organized to develop the Katie Fry lode, near Leonai. The officers are: E. J. Merrin, president; J. W. Douglas, vice-president; R. E. Porterfield, secretary and treasurer; Geo. R. Trask, of Wallace, Ida., and J. F. Congleton, of Milan, Wash., trustees. A contract for a 200-ft. tunnel has been let to Magnus Johnson, of Leonai, and work is progressing rapidly. The tunnel starts near the creek level in Boulder Canyon.

Shoshone County.

Helena-Frisco Mining Company, Limited.—The new Riedler pump is at work on the 1,600 ft. level of the mine at Wallace. It works against a head of 1,000 ft., and now handles 300 gals. a minute, though guaranteed to throw up to 1,000 gals. It has been tested and is reported to show a saving of 48% in fuel over the pump used before. The steam is brought through the 1,200-ft. main tunnel and down the 1,000-ft. shaft.

Ore is hoisted in double-decked cars through a 2-compartment shaft, and 50 tons an hour can be handled from the 1,600-ft. level. Most of the ore comes from the 1,400-ft. level. A new vein south of the present one has been drifted on 300 ft., which is said to show 80% lead and 100 oz. silver. At the 1,600 the main vein is reported to be over 27 ft. wide. Joseph MacDonald is superintendent.

MICHIGAN.

Copper.

Old Colony Copper Company.—This concern is organized by the Union Copper, Land and Mining Company, with 100,000 shares of $25 stock, to own and develop 1,200 acres of land now owned by the Union Company and the St. Mary's Canal

Mineral Land Company. This land is east of the Calumet & Hecia Company. This is the first of several separate companies which the Union and St. Mary's companies intend to exploit.

Pawnee Mining Company.—This company, which will work the Lac La Belle property in Keweenaw County, has 21,000 acres of land. Two shafts have been sunk about 30 ft. About 20 men are at work.

Iron—Gogebic Range.

Oliver Mining Company.—In a recent interview at Milwaukee Dr. N. P. Hulst stated that this year's output of the Norrie, East Norrie, North Norrie and Pabst, at Ironwood, amounted to 832,348 tons, and the Tilden at Bessemer produced 352,445 tons.

Iron-Marquette Range.

(From Our Special Correspondent.)

Ore Shipments.—The following are shipments from Marquette range mines, as compared with 1897:

	1897.	1898.
Cleveland Cliffs	718,008	865,900
Lake Superior	376,761	690,000
Lake Angeline	490,724	463,040
Lillie	112,787	209,462
Negaunee	181,181	191,000
Champion	137,599	163,200
Republic	124,342	140,000
Winthrop	107,006	122,770
Cambria	110,548	102,625
Queen	239,976	58,000
Jackson	79,101	54,570
Princeton	....	25,250
Richmond	4,786	25,000
Lucy	....	1,935
Consolidated	6,886	....
Dexter	1,237	....
Ogden	986	....
Rolling Mill	3,975	....
Volunteer	1,617	....
Wheat	942	....
Totals	2,711,505	3,086,552

The total this year is almost 100,000 tons more than in any year in the history of the range, extending back to 1854. The largest preceding season was 1890, being 2,993,664 tons. There has been mined out of this range since mining begun there a grand total of 52,375,000 tons. The enormous total of the Cleveland Cliffs Company for the present year is due considerably to the large old stockpiles, some of them moss-grown, that have been shipped away and sold. The most mining for the year was by the Lake Superior Company, which has mined since the beginning 8,265,000 tons. The Cleveland Cliffs, Lake Superior and Lake Angeline are located at Ishpeming, and the Winthrop is close by. The Cambria and Lillie, Jackson, Queen and Negaunee, the Richmond and a number of idle siliceous mines on the Cascade range, and the champion and Republic at the towns of those names.

Iron—Menominee Range.

Chapin.—At D shaft the underground and surface haulage plants have been removed. The water column of the great Allis pump has been taken out of the shaft, and the hoisting plant will soon be moved. The shaft will soon collapse. Ore is being stocked at the Hamilton and Ludington shafts.

Commonwealth Iron Company.—The company is sinking a 300-ft. shaft on the Buckeye property, about a mile from the Badger, at Commonwealth, in the hope of developing a body of clean ore.

Florence.—Ore shipments from the Florence have ceased for the season. Over 20,000 tons in excess of the original amount called for were shipped, and about 10,000 tons remain in stock.

Hemlock River Mining Company.—This company is offering wages of $1.60 a day for trammers, $1.75 for machine helpers, and $1.85 to $2.15 for machine men.

Monitor.—The lease of the Breitung interest in this mine, near Crystal Falls, to Corrigan, McKinney & Company, of Cleveland, O., has been signed, and work begun after five years' idleness.

MINNESOTA.

(From Our Special Correspondent.)

There has been a gradual readjustment of wages in the mines on account of a raise by one or two companies, and the departure of many men to the copper country, where they desire to work at the same wages, as copper country employment is regarded more desirable. Since the raise in pay at the Ironwood mines of the Oliver Company, there has been a raise to the Oliver schedule at all mines on the Gogebic, and the Vermillion has shared the advance. The Chandler raised last week to $2 a day for miners and about $1.75 for common labor, and the rest are following suit. This all brings pay in the mining country back to nearly where it was in the palmy days of 1892, when miners got from $2.15 to $2.30. In the fall of 1893 miners who could get employment were working for $1 a day, and trammers for 75c. or thereabouts.

The Security Land and Exploration Company has elected these officers: J. T. Hale, president; R. H. Palmer, vice-president; E. C. Gridley, secretary; G. W. B. Buck, treasurer; directors, these and Alf. Merritt, B. T. Hale and L. C. Palmer. This company owns the fee to the Sparta Mine, and the Shaw and other properties on the Mesabi.

From December 1st to the 7th there were 18 cargoes of ore shipped from the docks of the Duluth & Iron Range road to Two Harbors, in all about 65,000 tons. This is later than ore has ever been shipped from Lake Superior in the past. Wheat shipments from Duluth were kept up till the 12th, and the Sault Canal has been open till the middle of the present week, making a season of 240 days for canal navigation; longer than ever before.

To December 1st there were shipped through the Sault into and out of Lake Superior 20,667,333 tons of freight, an increase over the preceding year of nearly 3,000,000 tons. To the close of navigation this will be increased to about 21,000,000 tons. More than half of this total will be iron ore, eastbound; 3,000,000 tons has been wheat, flour and other grains, and about the same has been coal. The rest is minor articles.

When the changes in grades on the Duluth & Iron Range road are completed there will be a maximum grade against traffic, that is going to the docks, of 6%, as against 1.25% now, except at one point, while the maximum grade for light traffic will be reduced from 3% to 1.5. The one point at which grades against traffic will still be high is the divide across the Mesabi Range, where ultimately a short tunnel will have to be constructed at a cost of about $250,000.

Eight diamond drills are at work on various points of the Minnesota ore fields by the Minnesota Iron Company, near its hard ore mines of the Vermillion Range, two at Mountain Iron for the Rockefeller Company, and one at the town site of Eveleth for the fee holders.

Iron—Mesabi Range.

(From Our Special Correspondent.)

Oliver Iron Mining Company.—This company is doing considerable stripping at its Oliver and Lone Jack mines, but will discontinue work very soon on account of frost.

Sellers.—This property of the Consolidated Company is hoisting about 450 to 500 tons a day, with 100 men employed. Miners are working by contract, and are making from $2 to $3 a day. Probably the mine will be busy all winter.

Sparta Iron Company.—Winston Brothers & Dear have begun suit against this company for $24,294, alleged to be due on a stripping contract.

Iron—Vermillion Range.

(From Our Special Correspondent.)

Chandler Iron Company.—This mine is employing about 450 men, and has raised pay to the $2 scale for miners.

Minnesota Iron Company.—This company, at its hard ore mines, at Soudan, has found it difficult to keep men, and its force is not now what it desires. There has been a constant drain to other mining districts, where alluring prospects are held out to experienced miners.

Oliver Iron Mining Company.—This company expects to stockpile about 200,000 tons during the winter, and to ship in 1899 about 600,000 tons. It will employ some 700 men as soon as there is room.

MISSOURI.

Jasper County.

Narragansett Lead and Zinc Company.—This Boston, Mass., company has elected the following officers: President, Portal M. Black; vice-president, Fred J. Ryder; treasurer, Charles A. Clark, and directors, F. J. Hart, Alfred Decker, Hiram T. Chapman and Mahlon D. Currier.

(From Our Special Correspondent.)

Joplin Ore Market.—The past week has been unfavorable for mining. Severe weather has seriously interfered with outdoor work, and a cut of $5 in the price of zinc ore caused many operators to keep the ore in their bins for higher prices. In Aurora alone 21 cars of zinc ore were held over, and the falling off in Joplin, Galena and other large camps was tremendous. The Eagle at Belleville shut down this week to make repairs, and the top price elsewhere was $35 per ton.

The first of the year is at hand, when both merchants and manufacturers take inventories, and many of the big smelteries are probably prepared with stocks of ore on hand sufficient for contracts of the immediate future and to anticipate the natural falling off in the output during the bad weather. There was no change in the price of lead ore, which sold throughout the week at $20.50 per 1,000 lbs. During the corresponding week last year top grade zinc ore sold at $24.50 and lead ore sold at $24.25 per 1,000 lbs. The zinc ore sales that week were less than last week by 1,305,480 lbs., but the lead ore sales were greater by 182,570 lbs., and the value was less by $49,853.

For the corresponding 49 weeks of last year the zinc ore sales were less by 95,437,370 lbs.; but the lead ore sales were greater by 5,809,490 lbs., and the value was less by $2,277,287. As compared with the preceding week sales were less by 1,719,590 lbs. of zinc ore and 359,640 lbs. of lead ore, and the value was less by $48,801. Following are the sales of lead and zinc ores from the different camps in the district for the week ending December 10th: Joplin—Zinc, 1,507,170 lbs.; lead, 209,180 lbs.; value, $29,990. Carterville—Zinc, 922,140 lbs.; lead, 80,940 lbs.; value, $16,875. Webb City—Zinc, 480,740 lbs.; lead, 25,290 lbs.; value, $8,451. Oronogo—Zinc, 755,370 lbs.; lead, 5,240 lbs.; value, $12,859. Central City—Zinc, 616,790 lbs.; lead, 26,020 lbs.; value, $10,672. Stotts City—Zinc, 42,440 lbs.; value, $743. Duenweg—Zinc, 397,300 lbs.; value, $6,357. Galena—Zinc, 2,133,210 lbs.; lead, 136,790 lbs.; value, $38,002. Aurora—Zinc, 675,000 lbs.; lead, 45,000 lbs.; value, $7,325. Carthage—Zinc, 115,420 lbs.; value $2,019. Belleville—Zinc, 66,230 lbs.; lead, 1,650 lbs.; value, $1,193. Hell's Neck—Zinc, 47,310 lbs.; lead, 5,870 lbs.; value, $958. Lehigh—Zinc, 12,110 lbs.; lead, 2,680 lbs.; value, $260. District totals for the past week—Zinc, 7,771,230 lbs.; lead, 538,660 lbs.; value, $136,624. District totals for 49 weeks—Zinc, 423,888,650 lbs.; lead, 49,361,240 lbs.; value, $6,521,880.

MONTANA.

Flathead County.

Silver Cable.—Chas. Seifert, of Libby, has 8 men at work. The tunnel is in 250 ft. on the lead. A new bunk house is finished.

Snowshoe.—At this Libby mine the mill has shut down from a short supply of water. The large tunnel to tap the vein 150 ft. below the present working is in 60 ft.; work has stopped till the compressor plant is in running order. A winze in the upper tunnel is showing some very good ore.

Granite County.

Mussingbrod Mill.—This mill, at Garnet, has handled ore from the Lead King with good results, and is to treat ore from the Shamrock. Mr. Hollingsworth, formerly of the Bi-Metallic Mill, at Granite, is in charge.

Jefferson County.

Baltimore.—James Davidson, of Butte, who recently leased this mine in Boomerang Gulch, near Basin, has shipped 3 carloads of ore to the Butte smelters. The ore body is reported to be 5 ft. wide, running in copper with some silver.

B. & G. Mining Company.—Regular shipments from the B. & G. Mine, at Clancy, continue. The parties working the property have organized under this name, with R. A. Bell, president; Charles E. Gable, vice-president and manager; A. L. Smith, secretary and treasurer.

Copper Jack.—This Clancy mine has shut down, it is said, on account of the ore in the drifts at the bottom of the 200-ft. shaft being too low grade.

First Shot.—A good strike of high grade ore is this claim at the head of Rocker Creek, owned by T. T. Lyons and Henry Sherlock. The ore runs in gold, silver and lead. The claim is 3 miles north of the Eva May, owned by the Basin & Bay Slate Mining Company.

King Solomon.—Sinking progresses at this Lump Gulch mine.

(From Our Special Correspondent.)

Hope.—A station is being cut at the 500-ft. level, and a pump is being placed there. When the station is completed a drift will be run on the ore body to the adjoining claim, known as the Katie. Work on a 500-ton concentrator will soon begin, so as to have it in operation next spring. At the 200 and 300-ft. levels a great deal of development has been done, and some rich ore taken out in the past. This, in a measure, justifies the owners in deeper prospecting.

Madison County.

Armour.—This mine, in Hurlburt Canyon, is shipping good ore to the Butte smelters.

German Bar.—This placer company, near Virginia City, and its neighbor, the Conroy, owned by the same parties, are reported to have had a prosperous season on Alder Gulch. A. M. Bigelow, the manager, has returned to Boston.

Twin Bridges Smelter.—It is said that the new plant will be completed by January 1st.

Meagher County.

(From Our Special Correspondent.)

St. John.—John Blewett and W. W. McDowell have secured a $20,000 lease and bond on this mine, at Copperolis. Several men are at work, and some good assays have been made. The first carload of ore from the property has been sent to the Butte Sampling Works.

Park County.

Trail Creek Coal Company.—This company has its new machinery in. The tunnel has been driven over 150 ft.

Silver Bow County.

Boston & Montana.—A Butte dispatch says: Upon the application of James Forrester and John MacGinniss, made in the District Court, Judge Clancey on December 15th appointed Thomas R. Hinds receiver for the company, recently reorganized under the laws of New York. Hinds is county treasurer. His bond as receiver is fixed at $105,000. In the complaint Forrester and MacGinniss claim some stock in the company, and object to the transfer of the prop-

erty from the Montana corporation to the one recently organized under the laws of New York. They allege that since the transfer was made the New York company has diverted the proceeds of the property to persons not stockholders. MacGinniss is vice-president and assistant manager of the Montana Ore Purchasing Company, of which F. Augustus Heinze is president and general manager.

(From Our Special Correspondent.)

Alice.—The Blue Wing, now the chief producer, shows better than ever. Ore in sufficient quantities, and rich enough in gold and silver, has been struck at the 500. At the 400-ft. level the usual amount of ore is being extracted, and a drilling machine is working on development. The 300 is also producing considerable ore, while a small amount of prospecting is going on.

Boston & Montana.—In the $500,000 damage suit brought by Miles Finlen, Judge Clancy has issued an order requiring defendant to appear in court on the 24th of this month, and show cause why it should not be restrained from the further acts of trespass alleged in the complaint issued a week previously. The complaint was of mining ore from the Gambetta and Piccolo claims, the vein of which, plaintiff agrees, has its apex in the Minnie Healey.

Butte & Boston.—In local mining circles for some time past there have been hints at some impending changes, and a reported consolidation of the Butte & Boston and Montana Ore Purchasing Companies. It is stated that F. A. Heinze himself informed certain parties in Butte that before long he would be general manager of the Butte & Boston properties.

Ella.—After the new shaft in Meaderville was abandoned a short time ago, the company decided to pump the water from the old workings and sink the shaft from the 250-ft. level to the 300. This has been done, and at the 300 a rich body of silver ore carrying a low per cent. of copper has been struck. At present 12 men are at work. John Bordeaux is one of the principal owners of the Ella, a strip of ground on which formerly the old smelter of the Boston & Montana stood. New machinery has recently been put in. While many thought a law suit would be the result of Mr. Bordeaux's actions, the Boston & Montana Company so far has not molested him.

Monitor Tunnel Company.—The Monitor, Sunlight, Alta, Burner, Fraction and New Oterald, a group of mines in Park Canyon, have been reorganized and will be worked under this name.

Montana Ore Purchasing Company.—This company recently filed in the United States Court an answer to the complaint of W. J. Ladd, of Boston, who claimed the Heinzes, who are working the Cora Mine on lease, had extended their drifts into the Silver Queen. The Heinzes admit they entered beneath the surface of the Silver Queen, but not unlawfully; that the ore extracted was taken from a vein having its apex within the Cora lode, and that the value of the ore extracted did not exceed $450.

NEW JERSEY.

Middlesex County.

North American Chemical Company.—This company was organized some years ago by John W. Mackey, Jr., and other capitalists, and a plant was erected at Perth Amboy, N. J., for manufacturing aluminum and soda from clay. The venture proved a failure, as the aluminum and soda produced were of inferior quality, and Charles H. Runyon was appointed receiver. The claims amounted to $140,000, but many of them had not been proved. After paying all the proved claims the receiver recently said he had on hand $2,300. The creditors will receive 10% of their investment.

PENNSYLVANIA.

Bituminous Coal.

Tide Coal Company.—The Phillips Mine Supply Company, of Pittsburg, has completed a very complete river tipple and screening system for this company at Chamouni.

(From Our Special Correspondent.)

Foreign Labor.—Crowds of foreigners, mostly Hungarians and Slavs, who constitute a large portion of the labor in the Connellsville region, arrived at Connellsville this week, and have scattered to different parts of the region. On account of the firing up of many ovens, labor of the right kind is scarce, and the Hungarians and Slavs are not slow about notifying their friends in the "old country." Three foreign steamship agents in Connellsville are doing a fair business in this line now.

W. J. Rainey.—W. J. Rainey's new coke crusher at the Mt. Braddock coke plant is now about half completed, and will be in operation, it is said by the officials, January 1st. Some time ago Rainey drew up plans for erecting a 200-oven plant on the west side of the tracks of the Fairmont branch, and some preliminary grading was done, but the work was suspended, and has given way to the erection of a new plant on the Warden tract, near Mt. Pleasant, in the other end of the coke region.

Slate.

(From Our Special Correspondent.)

November Shipments.—Last month the Bangor & Portland Railway hauled 583 cars of slate, 564 of roofing and 19 of school slate. In November, 1897, 542 carloads were carried. The Lehigh & Lackawanna branch of the Central Railway of New Jersey hauled 129 cars of roofing slate and 11 cars of school slate; 176 cars received from connecting lines were also taken over the road.

Cut Prices.—A conservative estimate of the money loss to the slate producers of the Bangor Valley during the past season, through cut prices and the partial collapse of the Slate Manufacturers' Association, is placed at $25,000. The association gives promise of taking on a new lease of life.

Jackson Slate.—A new 75 H. P. double drum hoisting engine has been placed in position. Slate will be made until after the holidays, after which the balance of the winter will be spent in removing top and cleaning up the quarry.

Large Block.—It is claimed that the largest block ever taken out of a slate quarry was mined at the Grand Central one day last week. It measured in the rough 11 ft. 6 in. by 4 ft. 6 in. and was 19 in. thick. The total production of the block was 110 blackboards, aggregating 2,376 sq. ft. of surface.

Masters' Sons.—Slate making will be continued all winter, as far as the weather will permit, the quarry being in good shape. The firm is ending a very prosperous year. Several large foreign orders are being filled.

Stephens, Jackson & Company.—Slate making will be discontinued after the holidays, and work will not be resumed until early in the spring.

SOUTH DAKOTA.

Lawrence County.

(From Our Special Correspondent.)

Bald Mountain District.—F. C. Smith, of Deadwood, and F. L. Langan, of Minneapolis, have bonded about 60 mining claims in the vicinity of Terry and Portland. The bonds embrace some of the best mining ground in this district, including mines in Anna Creek, the Decorah and adjoining mines at Portland, and some valuable property north of Terry.

Buxton Company.—At Terry are the Big Bonanza and Buxton mines, owned by this company. The main ore body, the Big Bonanza, is nearly worked out. Two dinkies of ore are shipped daily. The Buxton Mine is also nearly worked out. Three dinkies per month are shipped. Messrs. Chapman and Waugh have the supervision of these properties.

Chicago & Two Bit.—The shaft is down to quartzite, 512 ft. from surface. James Hardin, superintendent, states that a station is being made at the bottom, preparatory to drifting for ore shoots. This is the deepest shaft in the camp, and it drains the entire district.

Clinton Company.—This company operates a mine adjoining the Old Portland, the ore being taken out of the main working tunnel of the latter. There are three shoots of ore, which average 3 ft. thick. Crosscuts are being run to determine the size of the largest ore body. One dinkie of ore is shipped daily to the smelter. The company is also doing work on the Jessie Lee Fraction, adjoining the Empire Mine on the west. This company's property is also under the charge of Messrs. Chapman and Waugh.

Dakota Maid.—General John Walker, manager of the Hercules Company, has purchased a quarter interest in the Morrow lease on this property from Secoy & Shaw for $2,000. A body of ore was struck recently near the dividing line between this and the Graham leases.

Edgemont & Union Hill.—This company is transferring all of its mining property to Messrs. Graham and Fletcher, of New York, as trustees.

Gold Hill Mining Company.—This Deadwood Company, capital stock $1,000,000, has been incorporated. Incorporators: H. H. Muggly, David L. Thompson, C. R. Francis, Chicago; S. A. Flower, C. B. Harris, Deadwood.

Sunset.—This shaft has been sunk 130 ft., in hard porphyry. An air compressor is being put in.

Pennington County.

(From Our Special Correspondent.)

Day Chlorination Works.—Col. M. H. Day has returned from Denver, where he went to get a superintendent for his new chlorination plant at Rapid City. The plant is practically completed. The contract for a 125-ton smelter has been let to the Colorado Iron Works, and work will begin next week.

Montezuma Mill.—A satisfactory clean-up was made this week. The mill is leased to Blank & Donnell, of Deadwood, to treat free milling ore from the King of the West group. The capacity of the mill is 40 tons per day. The average value of the ore thus far treated is between $5 and $6 a ton. The plant is equipped with Griffin mills, and has a concentrating plant.

UTAH.

(From Our Special Correspondent.)

Bullion and Ore Shipments.—During the week ending December 10th there were sent forward from the different smelteries and camps of the State 20 cars, or 653,724 lbs., lead-silver bullion; 4 cars, or 164,046 lbs., copper bullion; 32 cars, or 1,714,650 lbs., lead-silver ore.

Mining Activity.—There is no gainsaying the fact that an unprecedented and lively boom is on in Utah mining shares, and this, in loosening up money, has aided legitimate prospecting and mining, whatever the outcome to the local stock market may be. Probably the winter demand for mining machinery was never greater. The Salt Lake & Mercur Railroad has more loaded freight cars for the mines than its equipment can readily handle, and the Rio Grande Western and Oregon Short Line are taxed to the limit. Tintic is enlarging its ore production from fresh discoveries. Park City is furnishing new surprises. The remarkable copper uncoverings at Bingham are attracting greater attention, and attracting capital from abroad.

New Bullion and Ore Freight Tariff.—On December 9th it was learned that the Trans-Missouri freight meeting, in session at Kansas City, adopted a new bullion and ore freight schedule, operative January 1st next, which increases the lead-silver bullion charge $2 and ore $1 per ton. At present the rate on Utah base bullion is $11 per ton to the Missouri River, $12.50 to the Mississippi, and $13.50 to Chicago, and ore to the corresponding terminals, $9, $10.50 and $11.50 per ton, respectively. After December 31st the schedule on base bullion will be $13.50, $14.50 and $15.50; on ore and concentrate products, $10, $11.50 and $12.50 to the several terminals in order given. The new tariff will play quite a part in the treatment contracts for 1899, many of which are now being negotiated, and on the surface should aid home smelteries. Like Utah, the leading shipping camps of Colorado are displaying far more vigorous life than a year ago, and the railroad managements apparently think they should have a bigger share in the profit from the steadily increasing tonnage. Mine owners are making wry faces and complaining. Much of the ore forwarded is of such average low grade that an enhanced treatment charge, which will be the natural sequence of this new freight schedule, will almost prove prohibitive. As one shipper of low grade remarked to the writer, commenting on this subect: "The most exasperating feature of all this squeeze is the favoritism in rebates, in one way or another, given to the mines which can best afford to pay even a heavier freight charge, while moderate producers of low grade products see their profits approaching the vanishing point. There may be some relief in the Highland Boy smelter, and I believe there will be at least a temporary one." This new schedule, coupled with the less satisfactory silver and lead quotations, form the sole drawback to a much larger ore tonnage being maintained for a considerable period. For several months there has been a growing shortage of freight cars for the traffic in Colorado and Utah smelting products, and in one form, if not in another, it may be hoped this will aid in hastening to supply the deficiency.

Portland Cement Company, of Utah.—Additions are being made to this new plant which will augment its capacity from 100 to 150 bbls. per diem. Orders are coming to hand which threaten to tax even the enlarged output from Colorado, Montana and Idaho figure, while some handsome orders from the Pacific have had to be turned down. Manager Cairns has adopted some innovations with excellent results, which have brought Eastern cement folk to examine these works. His company meditate establishing a large plant at Bedford, Ind., the intent being to utilize the Bedford oolitic limestone and shale near by.

Grand County.

(From Our Special Correspondent.)

La Sals.—Winter has set in, and in the high altitude of La Sals—8,000 to 11,000 ft.—all work is suspended till spring. Last spring there was little more than a few surface prospects; to-day there is assurance of good producing ledges. J. H. Clark, of Denver, who is backed by some Iowa people, was one of the last to leave. He has opened a coming mine at the head of Miner's Creek, in the middle division. Warren Smith, a former Government surveyor on the Uncompahgee reservation, has bought some valuable ground next to Clark's. The De Arcy Brothers, of Denver, have a good thing on Mill Creek, on which they will spend considerable money in 1899. Miner's Basin was the attraction this season. Little has been done but assessment work, yet sufficient ore is shown to stand investigation. H. E. Woodland, of Aspen, Colo., had two prospectors all the summer and fall on the east slope of the South End, and on two claims active development will be pushed in the spring. Others have made genuine finds. It is conservative to say that systematic mining will begin on at least 10 properties so soon as snow is gone, for the drawback of distance from rail communica-

tion and bad roads has been remedied in part.

Iron County.

(From Our Special Correspondent.)

Horseshoe.—Among the latest finds is a strong 4-in. seam, carrying $238 gold per ton, besides big silver values. Ben Johnson claims that if this is not a mine the moon is made of mud.

State Line Gold Mining Company.—The sheriff has taken possession of the pioneer mill of the district, to be sold on December 15th. A. Popkiss has failed utterly in his attempt to treat the ores.

Utah Spur.—J. J. Knight is back in State Line putting up cabins and getting in supplies for winter work. The consignment of ore sent to Salt Lake proved all that was looked for.

Juab County.

(From Our Special Correspondent.)

Tintic Shipments.—For the week ending December 10th the smelter products and bullion shipped from the three rail points of the district were 100 cars of ore, 6 cars of concentrates, 5 bars of bullion, and were supplied from the following properties: Bullion-Beck, 10 cars ore; Grand Central, 18 cars; Swansea, 18 cars; Humbug and Uncle Sam, 10 cars; Mammoth, 9 cars; Gemini, 7 cars; Centennial-Eureka, 6 cars; South Swansea, 6 cars; Godiva, 4 cars; Sioux, 2 cars; Joe Bowers, 1 car; Dragon Iron, 6 cars hematite for flux. Mammoth sent out 4 cars concentrates and 5 bars of bullion, and Eureka Hill 2 cars concentrates.

Centennial-Eureka.—Some good grade ore is being sent forward. During the past season substantial reserves of shipping ore have been blocked out, and the reserves of milling ore augmented. This month the company resumes dividends, starting at $15,000.

Grand Central.—The new boilers are on the ground, and surface improvements move apace. The production is maintained at 75 cars a month.

South Godiva Mining and Milling Company.—Incorporation articles were filled with the Secretary of State on November 28th. Capitalization, $30,000; shares, 10c., with 60,000 set apart for treasury purposes. Principal office at Salt Lake City; annual meeting first Monday in December. Officers and Directors are: R. G. Wilson, president; John W. Burton, vice-president; A. L. Jacobs, secretary-treasurer; Theodore Meyer, all of Salt Lake City, and William H. Ryan, of Eureka. Realty consists of Lake View Lode Claim, patented, in Tintic district.

Salt Lake County.

(From Our Special Correspondent.)

Bullion Mining and Milling Company.—Incorporation articles were filed with the Secretary of State on November 21st. Capitalization, $100,000; shares, $1; with 50,000 shares for treasury purposes. Principal office at Salt Lake City; annual meeting first Monday in October. Officers and directors are Isaac Brockbank, president; James Gilbert, vice-president; Orson Sanders, secretary-treasurer; M. J. Hudson, Otto Hudson. Mr. Brockbank resides in Salt Lake City; the others at Murray, Utah. The realty consists of Bullion and Bullion No. 1 lode claims, in Big Cottonwood mining district.

Highland Boy.—The 43 towers of the Bleichert wire tram, connecting the mine with the Rio Grande Western, from 16 to 75 ft. tall, are finished. The tramway is 12,700 ft. long, takes a straight shoot over the mountains, and the elevation between terminals is 1,200 ft. There are 123 buckets, the load for each is 600 lbs., though 800 can be carried safely. Engineer Johnson has made the final alignment, and the wire rope will be strung. At the mine recent ore uncoverings in No. 6 indicate that copper values hold up in depth.

Summit County.

(From Our Special Correspondent.)

Ontario.—The Marsac mill still runs on tailings from the Ontario mill dump, treating 80 tons daily with a fair margin of profit. Superintendent Chambers again states that there is no likelihood of the mine resuming its old-time vigor until silver is firm considerably above 60c. per oz. Under present conditions 40 oz. silver ore will give not over $2 per ton profit.

Park City Shipments.—In the week ending December 10th the following smelter products were sent forward through the Mackintosh sampler: Silver King, crude, 722,260 lbs.; Anchor, concentrates, 206,800 lbs.; Ontario, crude, 204,810 lbs. Total, 1,133,870 lbs.

Tooele County.

(From Our Special Correspondent.)

Chloride Point.—Connection is made with the Gold Belt water system, and the mill is running full capacity. Development in Surprise workings continues favorably.

De La Mar.—Eight of the new leaching tanks—each 25 by 50 ft. and 5 ft. deep—are in commission. Originally there were 12, and the 10 new ones make 22 tanks in the leaching department. While the furnace changes are in progress, the bulk of ore put through is free cyaniding. At present the mill handles about 400 tons per diem. Captain De La Mar says the rumor of his selling his Mercur and Nevada mines to a London syndicate for $10,000,000 or any sum is not true. However, there are rumors about which hint that the Captain will be the managing director of what may be America's largest gold company.

Gold Belt Water Company.—At a recent directors' meeting Manager Cohen's resignation was accepted, and Victor M. Clement elected in his stead. At the same time George H. Robinson resigned as director, and was succeeded by Duncan McVichie. It is said the Sunshine Company's entrance in the Mercur water field will be resented. This locking of horns will hardly prove serious, as the demand for water is ample for both.

Hillside.—Incline shaft some 30 ft. below 300 level encountered mineralized material which has shown seams carrying $7 gold.

La Cigale.—On December 5th the Howell-White roaster was started satisfactorily. The following day some 25 tons were put through the crusher and rolls. After a few minor adjustments and changes all is ready for the mill to begin work next week. The intent is to treat but 50 to 75 tons daily at first. More men have been put on underground. La Cigale is the property of the Boston & Mercur Gold Mining Company.

McKinley Gold Mining Company.—Incorporation articles were filed with the Secretary of State on November 26th. Capitalization, $50,000; shares, 10c., with 100,000 shares devoted to treasury needs; stock assessable. Principal office at Salt Lake City; annual meeting second Monday in December. Officers and directors are: S. W. Morrison, president; J. J. Stewart, vice-president; E. W. Genter, treasurer; Clesson S. Kinney, secretary; Ben D. Luce, Daniel Eyer, F. L. Parker, all of Salt Lake City. The realty embraces a group of 15 claims, on Lion Hill, joining Northern Light territory, where some good ore showings have been made.

Mercur.—All the leaching tanks of the new mill annex are finished. Pipe connections and ore conveyer will be completed in a fortnight, and by New Year's the plant will be ready to start, treating 400 tons, or thereabouts, per diem.

Northern Light.—Superintendent Legg states that the new ore body shows no sign of pinching out, and that it promises to be one of the richest finds in the annals of Lion Hill. The first smelter shipment is being made. An 80-ft. boulder, forwarded the other day to the company's office, carries 1,500 oz. silver, $30 gold per ton.

No-You-Don't.—Shipments are suspended at this Stockton property. Shaft is being put down 150 ft., which will give a depth of 550 ft.

Yellow Metal.—Under direction of E. P. Mitchener, a shaft is sinking on the gold vein, and a 150-ft. tunnel is being driven on the silver ledge. The gold vein carries ore quite similar to the Mercur. The property is in the Stockton neighborhood.

WASHINGTON.

Stevens County.

(From Our Special Correspondent.)

General Development.—The Palo Alto tunnel is going ahead. A shaft is being sunk on the Liberty. A ledge has been struck in a shaft on the Victory. A ledge was uncovered several weeks ago on the Reindeer. A tunnel will be started to strike the ledge at 100 ft. deep. A tunnel is being run on the Rambler 150 ft. Work has been started upon the Toledo, Friday, and Toledo Fraction claims. The Butte & Boston new tunnel is making good headway. New work has been started upon the Nelson claim, near the Tom Thumb. Work will be resumed on the Monroe. There are good croppings on this claim. Development on the Republic No. 2 group of claims is progressing with good prospects ahead. The Bodie, situated upon the San Poil vein, has been incorporated. The present owners are Rossland, B. C., people. Ample means will be provided to fully explore it. The Jumbo claim is to be incorporated in a few days. It has a fine ledge, with bold quartz croppings.

Ben Hur and North San Poil.—These companies have decided to drive a 600-ft. tunnel to tap the vein at the junction of the two claims at a depth of 300 ft. The average of the ore at the surface above where the tunnel will terminate is about $21 per ton.

Black Tail.—A shaft is down 50 ft., following a vein from 6 to 10 ft. wide, that dips eastward about 450. Gold values run from $6 to $25 per ton. A tunnel is in 650 ft. from the east side of Eureka Creek. It cuts the Surprise ledge 17 ft. in width, and about 200 ft. further in runs diagonally 50 ft. through the main lode of the Black Tail, which has an estimated width of 20 ft. At 465 ft. in is a north and south vertical fissure, with quartz from 20 in. to 5 ft. wide. At 490 ft. in is a vertical raise through porphyrite to the surface northeast of the shaft, cutting another quartz vein with a mean dip of 40°. The same vein is cut by this tunnel about 150 ft. east of the vertical fissure, where it strikes a few degrees west of north. The raise cuts the 40° vein 80 ft. above the tunnel level, passes up 25 ft. through it and thence 20 ft. to surface. From 80 ft. up in the raise a drift is in 30 ft. southward, with 6 ft. of ore and no footwall in sight. There the values range from $10 to $30 per ton in gold. In the raise the vein is 6 ft. wide and assays from $10 to $150 per ton.

George H. Casey, owner and operator of the Butte Sampling Works, at Butte, Mont., is investigating the feasibility of plain cyaniding for Republic ores with R. B. Turner, of Butte. The latter believes as high a percentage of the values can be recovered by plain cyaniding as by the Pelatan-Clerici process. He says that reducing the ore to 120 mesh makes the cost of the chemicals used excessive. He expects to grind the ore to 40 mesh or coarser and use less chemicals.

Golden Goose.—Work has started on a contract to drive the lower tunnel 50 ft. further.

Golden Harvest.—The breast samples from the tunnel are running from $40 to $50. Winter quarters for the mines, close to the tunnel, have been put up.

Little Cove.—The pumps have been pulled, and development transferred to the north end of the company's ground, where a tunnel is being driven to crosscut the Mammoth vein, 50 or 60 ft. above the top of the Little Cove shaft. It is in 150 ft. in hard Nob Hill porphyry, and will tap the vein about 100 ft. below surface.

Mountain Lion.—The building for the boilers and compressor is nearly ready. It is on the hillside below the tunnel. The building is 32 by 64 ft. The two boilers will be 5 ft. by 17 ft. 4 in. A Rand 14 by 24 in. duplex compressor will be installed. One Nos. 1 and 2, and two No. 3 Little Giant drills will be used for drifting. Additional drills will be used later for stoping. Drift will run north and south on the ledge. An upraise will connect the north drift with the 65-ft. shaft on the vein. The main tunnel will continue ahead to develop the Little Cove and Nob Hill or Mammoth veins. An amalgamating and cyaniding mill will be set up next spring.

Republic Gold Mining and Milling Company.—The November output was very light, owing to delays in the improvements to the mill.

Sans Poil.—The south drift on the lower tunnel level is in 109 ft., with the ledge widening from a pinch at 100 ft. to 3 ft. at the breast. The latest assay was $24 per ton. The north drift is in 80 ft., with the vein strong and assaying $37 at the breast.

Trade Dollar.—The tunnel has crosscut the vein, and a drift has started, following the hanging wall.

WYOMING.

Albany County.

(From Our Special Correspondent.)

American Soda, Glass and Chemical Company.—New York, Chicago and Denver capitalists have just incorporated this company and filed the articles of incorporation with the Secretary of State of Wyoming. The capital stock is $3,000,000, and the headquarters of the company will be at Laramie. The incorporators are W. G. Carter, O. S. Oakley and Charles Haas, with A. A. Padder, T. W. Flint and W. G. Kuyser as trustees. Mr. Padden has held a bond and lease on the Union Pacific alkali plant and soda deposits for a number of years, and has utilized the soda for glass-making in the East. The alkali plant was erected in 1895-6, and for two years manufactured sulphate, carbonate and alkali. The soda deposits are 13 miles from the plant and are connected by a railway. The product is pure and the deposits extensive. It is the intention of the new company to manufacture glass and chemicals. A glass plant was erected at Laramie about 12 years ago and several hundred tons of superior glass manufactured, but the plant was closed down. The raw materials, soda, sand and lime are found near together, and there are coal-fields only 35 miles away. The organization has been carried out through the advice of an able engineer who has made extensive investigations.

Carbon County.

(From Our Special Correspondent.)

Battle Lake.—Many of the copper prospects are improving with depth. The work this winter will open many ore bodies and many new shippers.

Doane.—This, the oldest mine in the camp, has been put in shape and considerable ore taken down. If the snow does not hinder, large shipments will soon be hauled to the railroad.

Haggerty.—Recently the Haggerty copper mine has had a large number of teams (10 horses each) on the road hauling ore to Ft. Steele to ship to Denver.

Sweetwater County.

(From Our Special Correspondent.)

Black Butte.—This coal mine near Rock Springs is now owned by the Thompson Investment Company of Butte, Mont. The new owner is putting in machinery preparatory to working the mine and shipping coal to Butte.

FOREIGN MINING NEWS

AUSTRALASIA.

New Zealand.

The Mines Department reports the gold exported from New Zealand in September and the nine months ending September 30th, as below in crude ounces:

	1897.	1898.	Inc.
September	14,279	14,933	654
Nine months	189,887	203,301	13,414

The gold exported this year was equal to 184,603 fine oz., or $3,815,749.

Exports of silver in September were 30,711 oz., an increase of 15,141 oz. over September last year.

CANADA.

British Columbia—Lillooet District.

Lorne Group.—This group of claims, consisting of the Marquis, Lorne and Golden King, and owned by Messrs. Williams, Young, Coughlan, May and Murray, has been bonded to Mr. C. F. Law of Vancouver for $15,000. The Lorne group has had considerable development work done, and the owners the past season built an arrastra and crushed 30 tons of ore.

British Columbia—East Kootenay District.

(From Our Special Correspondent.)

Fort Steele Locations.—About 1,700 quartz locations were recorded at Fort Steele during the present year. Of this number about 650 were new locations.

North Star.—The new double-compartment shaft is down 100 ft. Crosscutting will begin at the 300-ft. level. The hoist is ready for work.

British Columbia—West Kootenay District.

Hall Mines, Limited.—This company reports for the four weeks ending December 2nd a total of 18 days 3 hours smelting. The ore treated was 2,207 tons, yielding matte containing 53 tons of copper and 45,960 oz. silver. The average return was, therefore, 2.4% copper and 20.8 oz. silver to the ton.

(From Our Special Correspondent.)

During the past few days a considerable reduction in the working force was made in the War Eagle and Le Roi mines, in consequence of lumbering and other work.

British Columbia Gold Fields.—This company is working a large force on the Golden Wedge, in Slocan Division, from which favorable reports come. About 50 men are at work.

Rambler Cariboo.—This Slocan company has completed arrangements for its winter shipments.

Reco.—This mine will ship its output by the Kaslo & Slocan Railway, rawhiding the ore to the Cody Station.

Rossland Ore Shipments.—The ore shipments up to December 7th amount to 120,000 tons gross for the year. The gross value is placed at $3,240,000, being at the rate of $27 per ton.

Ruth.—The management has made arrangements to build a concentrator.

Le Roi.—The new management have authorized the statement that the new company has a capital of $5,000,000, of 200,000 shares at $25 each. It is stated that the whole of the capital has been subscribed for by the London & Globe Finance Corporation and the British America Corporation conjointly, these corporations having received the preference. This arrangement, it is stated, will supply the necessary working capital and satisfy the shareholders who subcribed for stock some time ago on the understanding that the Le Roi was one of the properties included in the Wright-McIntosh purchase.

There is considerable satisfaction expressed in Rossland at the arrangement, which leaves the great producer separate from the other properties in the camp purchased by the British America Corporation. These are at least 20 claims, some partially developed and others yet untouched. The report of the details as given in local papers is believed to be substantially correct.

MEXICO.

Lower California.

Ibarra Mining Company.—A strike of rich ore is reported in the 600-ft. level of this mine, at Calmalli, owned by San Francisco parties. A 10-stamp mill is being erected.

Mexico.

American Mining Company.—The company has recently bought an air drilling plant from the Ingersoll-Sergeant Company. The new mill will contain a Riedler compressor and a Fraser & Chalmers stamp mill.

NEWFOUNDLAND.

Dominion Coal Company.—Halifax, N. S., papers state that J. S. Lennan, treasurer of this company, has purchased iron deposits at Belle Island, owned and worked by Graham Fraser and others for the Ferrona Company, of Picton. It is reported also that the company has acquired the Ferrona Furnace, and proposes to mine next season 2,000 tons of ore weekly, and is also after other iron properties.

COAL TRADE REVIEW.

New York. Dec. 16.

Anthracite.

Continued cold weather with very low temperatures during the past week has stimulated consumption and thereby caused a more cheerful feeling among hard coal producers and dealers. Still, it is worthy of note that the increased demand is not as great as some have expected, and not nearly as great as it would have been had the large producers not jammed so much coal on the market at cut prices during the fall.

The November production was very nearly 4,800,000 tons, not as large a figure as some anticipated. This month's production is likely to be much less, probably under 4,000,000 tons. The stocks on hand at seaboard points on December 1st are reported 270,000 tons less than on the same date last year. The present outlook is for a much heavier consumption this month than in December, 1897, and some of the more sanguine sales agents are prophesying that tidewater stocks will be lower on January 1st than on the same day in a number of years.

In the West the market is in good shape. Dealers at the head of the lakes say that the supply at the docks is likely to run short before spring. In Chicago territory the demand is said to be affected by the large amount sold at cut prices in the late summer and fall. Stocks on dock at Chicago are said to be only about 150,000 tons greater than a year since. As much more coal in all probability will be consumed this winter than for several winters the outlook is good.

In the East, though higher prices are spoken of, the only size that is in short supply is chestnut. This is now quoted at about the same price as stove. Why this size, which has been for several years the hardest to get rid of should be in such demand this winter is rather puzzling. The most common explanation is the great demand from the West, where base burner stoves are in common use, which require this size; good times have enabled many people to indulge in luxuries—and one of these is a hard coal fire.

Other sizes in the East, particularly broken and egg, can be had cheaply enough, and large dealers do not appear to anticipate an immediate advance. At Boston the probability of higher ocean freights continuing through the winter is likely to affect prices. At New York, however, good free burning white ash can be had for about these figures f. o. b.: Broken, $3.10; egg, $3.25; stove, $3.50; chestnut, $3.45. The small sizes are quoted: Pea, $2@$2.25; buckwheat, $1.50@$1.90; rice, $1.30@$1.50.

Bituminous.

The seaboard bituminous trade is active. The demand is large, though probably in part factitious from the scare over poor deliveries on account of the short supply of cars and vessels. The difficulty in getting coastwise tonnage is still great, though consumers are beginning to realize the true condition of things, and are not so hysterical in their demands as they were at first. It is thought that in some cases consumers have put orders in several hands, and if one order were filled it would cancel the others. The short vessel supply ought to mean higher freights the coming season, and may have a healthy effect on those contractors who figured on low alongside or delivered contracts.

Nothing is heard of the proposed understanding between the presidents of the bituminous roads, though this is pretty nearly time for an understanding if it is to be effective the coming season. There is probably some hitch in the proceedings, which makes it difficult to come to an agreement.

One of the most troublesome features of the trade is the short supply of cars at the mines, many cars are reported utilized in the anthracite trade, and others are handling all rail shipments to a larger extent than usual.

Trade in the far East is good, and more orders could be procured if sought after by producers. Long Island Sound demand is larger than can be taken care of. New York Harbor trade is calling for coal, and all rail trade is good. Producers generally, in fact, are not looking for trade, having difficulty in taking what comes.

Transportation from mines to tide is slow. Many reasons are given for this, the principal one being a lack of motive power. Car supply is short, and shipments from the mines are cut down greatly on this account.

In the coastwise vessel market, vessels are very scarce, and in great demand while rates are advancing. It is still difficult to give correct quotations, but we name for to-day from Philadelphia, Providence, New Bedford and the Sound, $1.10; Wareham, $1.30@$1.35; Boston and Salem, $1.40@$1.45; Newburyport, $1.55@$1.60; Portsmouth and Portland, $1.40@$1.55, with from 10c. to 20c. above these figures from the further lower ports.

Prices are still down and show no improvement. We quote: Clearfield, best grade, $1.65 at Philadelphia, with poorest grades down to $1.20. George's Creek, $1.65 at Baltimore; New River, $1.65 at Newport News; Pocahontas, $1.65 at Norfolk. At New York the best grades are $2.20; poorest, $1.45.

Birmingham, Ala. Dec. 12.

(From Our Special Correspondent.)

The coal trade never was so active in the State of Alabama as it is at present. The mines are in full blast and cannot supply the trade. The larger producers are now buying coal from the smaller concerns in order to partly fill orders, which seem to be thrust on them without the least solicitation. Regular customers are increasing their orders for fuel, and no one is getting enough to stock. It is even stated that 10,000 tons of Pennsylvania coal has been purchased by producers here to send to customers and there is a famine on for the fuel. The railroads and larger industries are having trouble in getting their full supply.

The coal sales agent for the Tennessee Coal, Iron and Railroad Company has been working hard for some time now trying to satisfy customers who are not getting all the fuel they desire. The retail coal yards in Birmingham and other places in the State are running short on fuel, and the price to the retail consumer is going up.

In Jefferson County every mine is in full blast with the exception of one. There are several new mines being opened around Coalburg and Cardiff. The work on the Pioneer Manufacturing Company's mines at North Birmingham is progressing rapidly, and in a few weeks now a daily output at that place will be in order. Houses are being erected for the miners who will work there, and by January 15th next, the roadbed from the furnaces to the mines will be ready for the rails.

In Walker County the mines are working steadily and producing large quantities of coal. The orders being sent in to the operators are so numerous that in a short while, if they continue to come in, they will amount to more than can be filled. In Tuskaloosa and Bibb counties the mines are running steadily. The demand for this product is also very brisk.

The prices for fuel in this district are becoming stiffer right along. With the increased demand, the quotations have grown better.

In a few weeks now the new mine being opened in Marion County for the Illinois Central Railroad, will be ready to ship coal. On account of the urgent demand here and in this section of the country, no coal can be shipped down the barge line on the Mississippi River, though there are some orders from Mississippi and Louisiana.

Pittsburg. Dec. 15.

(From Our Special Correspondent.)

Coal.—The demand for coal is active, due to three causes, the sudden arrival of winter and increased demand for domestic purposes, and requiring more fuel to keep up steam; because buyers held off until late in the season, thinking that, from the condition prevailing, still lower prices would rule; and the uncertainty of the amount that would possibly be demanded for winter requirements.

Additional to these has been the enlarged demand for cars in all lines of commerce, and the shortage for forwarding coal. This has caused a demand, not so much for increased amounts, but for more regular shipments, and has excited apprehension among consumers that they would not be able to get the amount from day to day to supply their needs. Hence, they have been making an outcry that by daily press writers, has been mistaken for a shortage of coal that did not exist. All the mines in the River District are running nearly full, and there is every prospect that the activity will continue for some time. The rise in the Ohio was not sufficient for coal shipping purposes. The Chicago scale is nearing its expiration, but there is still a lively movement among the miners to uphold its provisions.

At Greensburg, Pa., a Pittsburg party has taken options over 16,000 acres of coal land in the township adjoining. It is said they are negotiating with a syndicate of Eastern capitalists for the sale of the land which will be developed and a coal road built.

The end of the lake season is in view, but a considerable tonnage is going forward by vessels that are willing to take chances in reaching their destination, and there are many of this class.

The Tide Coal Company of this city has opened a new mine at Lucyville, with machinery in it that cost $50,000. The Northwestern Mining and Exchange Company has purchased a tract of coal land, south of Dubois, Pa., that cost $300,000.

The Berwind White Coal Company is reported to have purchased 5,200 acres in Westmoreland County, which will soon be operated.

The rivers are closed with ice.

Connersville Coke.—Production and shipments of coke were about stationary as compared with the week previous. Shipments would have been larger if the car supply had been adequate. The production for November was larger than for any other month in the year, having been 626,391 tons. The next largest month was March, when the production was only a few

thousand tons less, at this rate the Connellsville production for the year will be 7,515,000 tons; of 18,462 ovens 14,880 were active; estimated production 154,866 tons as against 154,574 tons the preceding week. Fifty of the 70 ovens of the Parrish plant of the Dunbar Furnace Company were fired. This plant has been out of blast a long time. The company operates the Semet-Solvay by-product plant at Dunbar, and since the erection of the plant it has never stopped running.

The demand for coke all through the week was brisk. In the running order 5,256 ovens made six days; 9,967 ovens made five days; 20 ovens four days; 50 ovens of the Parrish plant fired up, two days; the Semet-Solvay by-product plant seven days, an average of 5.33 days. The shipments were: To Pittsburg, 2,950 cars; Points West, 4,555 cars; sent East, 1,392. Total, 8,897 cars.

SLATE TRADE REVIEW.

New York. Dec. 16.

The list of prices per square for No. 1 slate, standard brand, f. o. b. at quarries, are given below:

Prices of Roofing Slate.

Size, inches	Monson or Br'n ville.	Bangor.	Bangor Ribbon.	Alb'n, or Jackson Bangor.	Lehigh.	Peach Bottom.	Sea Gr'n.	Unfad'g Green.	Red.
		$	$	$	$	$	$	$	$
28 x 14	.....	.....	.....	.....	.....	.....	2.60	.....	.....
26 x 24	.....	.....	.....	.....	.....	.....	2.60	.....	.....
24 x 16	.....	.....	.....	.....	.....	4.75	.....	.....	.....
24 x 15	.....	.....	.....	.....	.....	4.75	.....	.....	.....
24 x 14	6.10	3.35	3.00	3.00	3.50	4.85	2.50	3.50	.....
24 x 13	.....	.....	.....	.....	.....	4.85	.....	.....	.....
24 x 12	6.60	3.35	3.00	3.00	3.50	5.00	2.60	3.50	.....
24 x 10	.....	.....	.....	.....	.....	5.00	.....	.....	.....
22 x 14	6.10	.....	.....	.....	.....	5.00	2.50	3.50	.....
22 x 13	.....	.....	.....	.....	.....	5.00	.....	.....	.....
22 x 12	6.60	3.50	3.00	3.00	3.00	5.00	2.6	3.50	..
22 x 11	6.50	3.50	3.00	3.00	3.00	5.00	2.75	3.75	.....
20 x 14	6.40	.....	.....	.....	.. ..	.....	2.50	3.50	.....
20 x 13	.....	.....	.....	.....	.....	5.00	.....	.....	.....
20 x 12	6 90	3.50	3.00	3 60	3.75	5.00	2.60	3.75	.....
20 x 11	6.80	.....	.....	3 25	.....	5.00	2.60	3.75	.....
20 x 10	6.80	4.00	3.25	3.25	3.80	5.10	2.75	4.00	10.50
18 x 18	.....	1.25	.....	.....	.. ..	.....	.....	.....	.....
18 x 14	6.50	.....	.....	.....	.....	.....	.....	.....	.....
18 x 12	6.80	3.50	.....	3.00	.....	5.00	2.60	3.50	.....
18 x 11	7.00	.....	.....	.....	.. ..	5.00	2.50	3.75	.....
18 x 10	7.20	4.00	3.25	3.25	3.80	5.10	2.60	4.00	10.50
18 x 9	7.10	4.00	3.25	3.25	3.80	5.10	2.60	4.00	10.50
16 x 16	7.00	4.25	.....	.....	.....	.....	.....	.....	.....
16 x 14	.....	4.25	.....	.....	.....	.....	.....	.....	.....
16 x 12	6.80	3.50	.....	3.00	.....	.....	2.50	3.50	.....
16 x 11	6.90	.....	.....	.....	.. ..	.....	.....	.....	.....
16 x 10	7.10	4 00	3.25	3.25	3.80	5.00	2.50	4.00	10.50
16 x 9	7.00	4.00	.....	3.25	3.80	5.10	2.25	4.00	10.50
16 x 8	7.20	4.00	3.25	3.25	3.80	5.10	2.25	4 00	10.50
14 x 14	7.00	4.25	.....	.....	.....	.....	.....	.....	.....
14 x 12	6.50	.....	.....	.....	.....	.....	2.25	.....	.....
14 x 10	6 60	3.50	3.00	3.00	3 75	...	2.25	3 75	10.50
14 x 9	6.50	.....	.....	.....	3.40	4.85	2.25	3.75	10.50
14 x 8	6 69	3.75	3.10	3.00	3.40	4.85	2.20	4.00	10.50
14 x 7	6.40	3.75	3.10	3 00	3.40	4.85	2.15	4.00	10.50
12 x 10	5.80	3.50	.. ..	....	.....	4.60	2.20	3.25	.....
12 x 9	5.60	.....	.....	.....	.....	4.60	2.15	3.25	.....
12 x 8	5.50	3.00	.....	3.00	3.25	4 60	2.15	3.25	9.00
12 x 7	5.00	3.00	.....	3.00	3.25	4.60	2.15	3.25	9.00
12 x 6	4.80	3 00	....	3 00	3.25	4.60	.....	3 25	8.50
11 x 10	.....	3.50	.....	.....	.....	.....	.....	.....	.....
11 x 8	4 50	.....	.....	.....	.....	.....	.....	.....	.....
11 x 7	4.00	.....	.....	.....	.....	.....	.....	.....	.....
10 x 12	.....	..	.....	.....	.....	.....	.....	.....	4.50
10 x 11	.....	.....	.....	.....	.....	.....	.....	.....	4.50
10 x 8	4.00	.....	.....	.....	.....	.....	.....	.....	6.50
10 x 7	.....	.....	.. ..	.....	.....	.....	..	.....	6.50
10 x 6	.....	.....	.....	.....	.....	.....	.....	.....	6.50
9 x 7	3.50	.....	.....	.....	.....	.....	.....	.....	.....

A square of slate is 100 sq. ft. as laid on the roof.

In Brownville and Monson delivery quotations can be had somewhat lower than above, which is also true of other brands. No. 1 Bangor are 50c. extra when full 3-16 in. thick. Purple sizes run 24 by 12 and 14 by 7, and vary from $3.75 to $4 per square. Variegated and mottled, $2.25@$2.90 per square, according to size. Intermediate sea green, sizes 24 by 14 to 18 by 10, $2.25@2.35; 16 by 12 to 16 by 10, $2.10; 16 by 9 to 14 by 8, $2 per square. Intermediate red, 14 by 7 in. and larger, $6; 12 by 6, 12 by 7 and 12 by 8 in., $5 per square, net.

Home consumption has received more attention lately, especially in the Middle West, owing to the low freight rates. The export demand has increased, and a new market has been opened in British territory for red and variegated roofing slate. Besides three more quarries near Fair Haven, Vt., have been purchased by the Englishmen who are interested in the Hower property at Danielsville, Pa. The roofing slate produced here will go to London. We understand these gentlemen have recently looked over some property in Pennsylvania with a view to purchasing the same. We heartily welcome new capital in our slate industry, and have no doubt with improved methods of operation our quarries can produce slate cheaper than Wales. Exporters generally speak encouragingly of our foreign business, and only recently a new firm in Liverpool has taken hold of American roofing slate. Abroad there is talk of a new Welsh price list, but in New York exporters say no change has yet been made.

During the week a contract for freight room to London over 1899 has been taken at 14s. 6d., while spot business is quoted at 15s. To Newcastle and Liverpool 17s. is asked. Concerning Australasia freights much is heard of an advance in the near future. The leading transportation companies are trying to amend the differences that have been harrassing this branch of the shipping business, and it is reported a favorable agreement may soon be arrived at. Freight rates to Sydney, Melbourne and other of the leading ports in Australasia have fallen within the past few years more than 50%, owing to the disagreement between the sailing and steamship companies. Australasia has been our second largest slate consumer during this period, and about ten years ago we exported nearly all our slate to that territory.

The exports of slate from New York during the week ending December 14, were as follows: To London, 37 carloads roofing ($9,760); Newcastle, 8 carloads ($1,800); Bristol, 11 carloads ($2,800); Liverpool, 1 carload ($150); Wellington, 38,170 pieces and 10 cases ($852); Copenhagen, 13 carloads ($2,600); Christiania, 7 cases ($20); Christiansund, 3 cases ($21); Laguayra, 3 cases ($10); total value, $18,013, making $29,235 for the first two weeks in December.

Exports of slate from the United States in October amounted to $106,343, against $118,227 last year. During the ten months ending October 31, 1898, the exports were $1,161,538, against $967,253 in 1897, and $374,538 in 1896.

We imported this week 15 packages slate pencils from Bremen, Germany.

CHEMICALS AND MINERALS.

(For current prices of chemicals, minerals and rare elements, see also page 750.)

New York. Dec. 16.

Heavy Chemicals.—Business continues good, and further contracts have been taken for bleaching powder, alkali, and chlorate of potash. It is understood that nearly 30,000 bags of chlorate of potash have been booked for next year's delivery. Imports this week included 245 bbls. and 534 casks bleaching powder; 450 drums caustic soda; 124 bbls. crystal carbonate; 140 bbls. soda crystals; 10 casks soda ash, and 100 cases cyanide of potassium. Receipts of domestic goods included 975 sacks soda ash. The imports into the United States during October were as follows: Bleaching powder, 8,883,667 lbs., against 9,891,292 lbs. last year; chlorate of potash, 448,060 lbs. (326,803 lbs.); caustic soda, 1,672,707 lbs. (2,175,597 lbs.); sal soda, 653,500 lbs. (926,062 lbs.); soda ash, 3,629,834 lbs. (9,407,003 lbs.). Prices unchanged. Quotations are: Caustic soda, domestic 60%, $1.50 per 100 lbs.; 70@74%, $1.40; 76%, $1.50 all f. o. b. works; $1.55@$1.65 delivered. Foreign caustic soda, high test, $1.60@$1.70 delivered, according to test and quality. Powdered caustic soda, 2¾@3c. Alkali, domestic, 55@60c. f. o. b. works; 65@70c. delivered; foreign, B. & M., 70@75c. Bleaching powder, English prime brands, $1.50@$1.65 per 100 lbs.; other brands, $1.40@$1.50; Continental F. prime, $1.50@$1.65. Bicarb. soda, domestic ordinary, $1.15@$1.25 per 100 lbs. f. o. b. works. Natrona brand, $1.65; "Arm and Hammer" brand, $3.25@$3.50, less the usual discount; foreign, $2.12½@$2.25 per 100 lbs., according to brand and style of package. Sal soda, domestic, 55@60c. per 100 lbs. f. o. b. works, less the usual discounts; English, 62½@65c. per 100 lbs. Concentrated sal soda, foreign (crystal carbonate), $1.60@$1.65 per 100 lbs.; domestic (monohydrate crystals, $1.25@$1.30 per 100 lbs.; "snowflake," $1@$1.12½, f. o. b. Syracuse. Chlorate of potash, crystals, 9@9¼c.; powdered, 9¼@9½c. per lb. for large lots.

Acids.—Buying is of a hand-to-mouth nature, while some business is being done on next year's account. So far the acid trade in 1898 has shown an increase over 1897 as regards volume. Export business has been especially good, and during the ten months ending October 31st, 1898, the United States showed a total of $153,666, or $69,804 more than last year, and $77,906 over the corresponding period in 1896. The exports of copper sulphate during the ten months of 1898 amounted to 12,952,183 lbs., valued at $413,023, showing a large increase over previous years. Prices are unchanged.

Quotations per 100 lbs., New York and vicinity, are as follows: Acetic acid, comenercial, No. 8, $1.30@$1.40; muriatic acid, 18°, $1.10 for drums and $1.15@$1.75 for carboys; 20°, $1.20@$1.87½; 22°, $1.35@$2.25, according to quantity and brand. Nitric acid, 36°, $3.50@$4.75; 38°, $3.75@$4.62½; 40° $4@$4.87½; 42°, $4.62½@$5.25. Oxalic acid, $6.25@$6.50. Mixed acids, according to mixture. Sulphuric acid, 66°, $1.10 for drums and $1.15@$1.75 for carboys. Chamber acid, 50°, in a jobbing way, $11.50@$12 per ton f. o. b. factory. Blue vitriol (copper sulphate), $3.75 per 100 lbs. for best grades.

Brimstone.—Buying is slow, with prices little changed. The stocks in Sicily on November 1st amounted to 222,261 tons, showing an increase of 7,050 tons as compared with 1897, and 30,544 tons over 1896.

This condition was brought about by the scarcity of freight room resulting from decreasing exports of Sicilian fruit to the United States, owing to our high tariff. Importers are of the opinion that shipments of brimstone will hereafter be made by the cargo instead of in ballast as heretofore, and this change will probably increase the cost of importation. Let our own producers of brimstone now adopt more vigorous operations to supply the home market. They can rest assured that the Sicilian Sulphur Trust will take advantage of the change in their method of exporting to increase prices. The imports of brimstone into the United States during the ten months ending October 31st, 1898, amounted to 142,587 tons, against 123,446 tons in 1897, and 115,436 tons in the corresponding period in 1896. Of our imports in 1898 only 1,414 tons were exported. Quotations at present are $21.25 @$21.50 for best unmixed seconds on spot, or soon to arrive, and $20.50@$21 per ton for futures, while thirds are $2 less.

Pyrites.—Importations have been heavier, and we note this week 4,842 tons iron pyrites from Pilley's Island, Newfoundland, and 2,282 tons from Huelva, Spain. We also note a charter of a Norwegian steamer of 1,138 tons to carry ore from Huelva to New York, Philadelphia, or Baltimore, at 8s. 6d., December sailing. Imports of pyrites into the United States in October amounted to 22,210 tons, valued at an average of $3.84 per ton. For the ten months ending October 31st, 1898, the imports aggregated 115,772 tons, having a total value of $363,697. Quotations continue unchanged as follows:

Spanish pyrites contain from 46% to 51% sulphur, the American from 42% to 44%, and Pilley's Island, N. F., about 50%. Quotations are: American lump ores (basis 52%), $3.25 per long ton f. o. b. mines, Mineral City, Va.; $5 per long ton f. o. b. mines, Charlemont, Mass., and $6.50 per long ton for Pilley's Island, delivered in New York. Fines are $2.75 per long ton, f. o. b. Mineral City, Va.; $4.25 at Charlemont, Mass, and $4.50 for Pilley's Island delivered in New York. Spanish pyrites, 10@13c. per unit, according to percentage, delivered ex-ship New York and other Atlantic coast ports.

Nitrate of Soda.—Buying for consumption is limited, while importers are taking advantage of the high freight market to make money, not alone in selling nitrate of soda, but in their charters. Many vessels have been chartered early in the year at a comparatively low rate, and some of these are only now being moved at about 30s. Spot nitrate of soda is being offered around $1.65, although $1.60 could probably get large lots. Futures are quoted $1.57½@$1.60 per 100 lbs., and it is said contracts cannot be had for $1.52½@$1.55 as reported. The steamship "Coya" is due with about 5,900 bags, much of which will go into immediate consumption. The statistical position of nitrate of soda is strong, and promises to remain so until next June. The exports from the West coast of South America to the United Kingdom and Continent from January 1 to November 30th, 1898, amounted to 7,100,000 bags, against 6,250,000 bags last year, while on December 1st, 1898, there were being loaded for those ports 760,000 bags, against 500,000 bags at the same time in 1897. The deliveries during the 11 months of 1898 were 7,475,000 bags, against 6,820,000 bags last year. These figures show that the total consumption of nitrate of soda has largely increased within the last few years.

Fertilizing Chemicals.—Market generally quiet, and prices easier. Imports were 1,000 bags manure salt, 5,750 bags sulphate of potash, and 2,525 bags muriate of potash. The exports of fertilizers from the United States during the ten months ending October 31st, 1898, were valued at $4,225,133, against $4,631,247 in 1897, and $3,804,037 in the corresponding period of 1896.

The stockholders of the Rasin Fertilizer Company of Baltimore, at a special meeting held recently, accepted the proposition made by the Virginia-Carolina Chemical Company of Richmond, Va., for the purchase of the company's plant in Anne Arundel County, Md. The offer made was $160,000 for the factory of the Rasin Company and a price for the merchandise which will show a surplus to the stockholders. The Virginia Chemical Company has also purchased the Monumental Chemical Works, adjoining the Rasin plant. The acquisition of the two plants gives the Virginia Chemical Company an ownership of 27 factories. The company has a capital of $12,000,000. The company will continue to operate its new purchase.

Quotations are: Sulphate of ammonia, gas liquor, $2.62½@$2.65 (basis 25%). Bone, $2.52½@$2.55 per 100 lbs. Dried blood, high grade Western, $1.77½@$1.80 per unit; New York, $1.65@$1.70 per unit. Azotine, $1.70@$1.75, basis New York. Concentrated phosphates (30% available phosphoric acid), 57½c. per unit. Acid phosphates, 13@15%, av. P_2O_5. 60@65c. per unit at sellers' works in bulk. Dissolved bone black, 17@18%, P_2O_5, $16@$16.50 per ton. Acidulated fish scrap, $10@$10½; dried, $18½@$19 f. o. b. fish factory. Ammonia superphosphates, high grades, $25@$26 per ton. Tankage, high grade, $14.50@$15 per ton f. o. b. Chicago, $18.50@$19 at New York. Concentrated tankage, $1.45@$1.50 per unit f. o. b. Chicago; low grade, $13@$13.50 per ton. Bone tankage, $19.50@$20.50; ground bone, $24@$24.50 delivered. Bone meal, $1.40@$1.50 f. o. b. Chicago.

Phosphates.—Shipments are falling off, while for export we note few charters. The exports of high grade Florida phosphate rock during November are reported by Messrs. Auchincloss Brothers at 30,595 long tons, principally to Germany. For the eleven months ending November 30th the exports amounted to 338,350 tons, against 331,740 tons in 1897, 299,253 tons in 1896, and 289,043 tons in 1895; chiefly to the Continental and Baltic ports. The shipments of phosphates from Bone, Algeria, in October, amounted to 12,943 tons, making a total of 704,609 tons for the ten months, distributed as follows: Constantine Phosphate Company, 309,610 tons; Crookston Brothers, 297,239 tons, and the Societe Francaise des Phosphates de Tebessa, 97,760 tons.

The imports of crude phosphates into the United States during the ten months ending October 31st amounted to 51,480 tons, against 5,597 tons last year, and 12,762 tons in the corresponding period of 1896.

Quotations at New York are: Florida high grade, 75@80% rock, $8.25@$8.50 per long ton f. o. b. Fernandina. The freight rate to New York is about $1.80 per ton. Florida land pebble, 68@73%, quoted at $5.25@$6 per ton, delivered in New York. South Carolina ground rock is worth $5.50 to $5.75 per short ton, delivered in New York; sun dried, $3 per 2,240 lbs. f. o. b. Ashley River; hot air-dried, $3.25@3.45 f. o. b. same place. Tennessee phosphates, $2.20@$2.30 f. o. b. Mt. Pleasant, according to quality.

Charleston, S. C., Phosphates.—Our special correspondent reports the shipments of phosphate rock from this port in November, at 10,452 long tons crude, against 7,266 tons last year, and 15,669 tons in 1896.

Valparaiso, Chile. Nov. 5.

(From Our Special Correspondent.)

Nitrate of Soda.—An unusual calmness for this time of the year has prevailed in the nitrate market, the low prices ruling combined with the scarcity of freight room tending to this result; moreover, the pending perchlorate clause still bars the way to business; one producer has, however, accepted it for a sale of the refined quality. Several English companies have suggested from London to-day a clause stipulating the deduction of the entire perchlorate contents, but only if exceeding 1%; the Directory on the coast will endeavor to carry through this proposal. As regards the projected combination, it appears that the scheme has again been renewed with the consent of all parties, the refractory producers now adhering to the original plan, but its final formation will still be a matter of time and discussion. We quote 95%, November-December, 4s. 8½d., and 96%, 4s. 10d. per cwt., both sellers. The price of 4s. 8½d. with 30s. all round freight stands in 6s. 8¾d. per cwt. net cost and freight without purchasing commission. Sales reported during the fortnight aggregated 220,000 qtls.

IRON MARKET REVIEW.

New York, Dec. 16, 1898.

Pig Iron Production and Furnaces in Blast.

Fuel used	Week ending Dec. 17, 1897. F'ces.	Tons.	Week ending Dec. 16, 1898. F'ces.	Tons.	From Jan., '97. Tons.	From Jan., '98. Tons.
An' racite	28	18,050	29	22,650	896 677	1,095,420
Coke.....	144	203,200	148	208.850	8,058,292	9,810,149
Charcoal.	19	5,200	18	6,350	244,811	297,046
Totals..	191	226,450	295	237,250	9,199,780	11,202,615

Activity is apparent in all branches of the iron trade, and the business done has reached a very large total. The producing markets are all in an excited state over large transactions pending. The Pittsburg reports show the heaviest sales ever noted at this season, and the consequence has been a general advance in prices. Sales of Bessemer pig have been heavy, and the outside producers, who are organized as the Bessemer Association, have for the present the command of the market, and have been able to secure an advance of 25c. a ton. It is quite probable that they will be able to hold this and possibly secure a further advance. Foundry iron has also been very active, and the Southern furnaces have taken a large amount of business. An all-round advance of 25c. a ton is now asked and generally secured by the Alabama furnaces for future deliveries.

Steel billets, wire rods and other forms of steel have also been advanced under pressure of active inquiry. The inquiries for finished material of all kinds are large, and many contracts are reported.

Rail trade continues active, and it is noticeable that the Eastern mills are securing the heavier share of the business. The Lackawanna Steel Company at Scranton is said to have taken orders for 100,000 tons.

Export business continues active, and there are some large foreign orders on the market for steel billets, plates, bars and rails. Among the latter are contracts for 30,000 tons for Australia and 200,000 tons for the Siberian Railroad and its extensions into North China.

Notes of the Week.

The American Tin Plate Company has filed articles of incorporation in New Jersey; the capital stock to be $20,000,000 preferred and $30,000,000 common. It is understood that the combination has secured all the tin plate mills in the country, after long negotiation, and that arrangements are now complete. The united mills have a capacity of about 8,000,000 boxes of 100 lbs. each of tin plates yearly. The full list of the mills in the combination is as follows: Ætna-Standard Iron and Steel Company, Bridgeport, O., 8 mills; American Tin-Plate Company, Ellwood, Ill., 20 mills, and Montpelier, Ind., 6 mills; Atlanta Steel and Tin-Plate Company, Atlanta, Ind., 6 mills; Baltimore Tin-Plate Company, Lisbon, O., 6 mills; Britton Rolling Mill Company, Cleveland, 3 mills; Cincinnati Rolling Mill and Tin-Plate Company, 4 mills; Crescent Sheet and Tin-Plate Company, 6 mills; Cumberland, Md., Steel and Tin-Plate Company, 5 mills; Ellwood Tin-Plate Company, Ellwood City, Pa., 5 mills; Falcon Tin-Plate and Sheet Company, Niles, O., 6 mills; Great Western Tin-Plate Works, Joliet, Ill., 4 mills; Humbert Tin-Plate Company, Connellsville, Pa., 6 mills; Irondale Steel and Iron Company, Middletown, Ind., 6 mills; Johnstown Tin-Plate Company, Johnstown, Pa., 4 mills; La Belle Iron Works, Wheeling, W. Va., 10 mills; Laughlin Nail Company, Martin's Ferry, O., 14 mills; Marshall Bros. & Company, Philadelphia, 6 mills; Monongahela Tin-Plate Company, Pittsburg, 14 mills; Morewood Company, Gas City, Ind., 8 mills; Morton Tin-Plate Company, Cambridge, O., 5 mills; National Tin-Plate Company, Anderson, Ind., 6 mills; National Tin-Plate Company, Monessen, Pa., 14 mills; Neshannock Sheet and Tin-Plate Company, New Castle, Pa., 6 mills; New Castle Steel and Tin-Plate Company, New Castle, Pa., 20 mills; Norton Bros., Maywood, Ill., 18 Norton machines; Norton Tin-Plate and Can Company, Baltimore, 16 sets; Ohio River Sheet and Tin-Plate Company, Remington, Pa., 2 mills; Pennsylvania Tin-Plate Company, New Kensington, Pa., 6 mills; Pittsburg Tin-Plate Company, New Kensington, Pa., 6 mills; Reeves Iron Company, Canal Dover, O., 4 mills; Shenango Valley Steel Company, New Castle, Pa., 30 mills; Somers Bros., Brooklyn, 3 mills; Star Tin-Plate Company, Pittsburg, 8 mills; Stickney Iron Company, Baltimore, 2 mills; St. Louis Stamping Company, St. Louis, 8 mills; United States Iron and Tin-Plate Manufacturing Company, Demmler, Pa., 8 mills; Wallace, Banfield & Company, Irondale, O., 4 mills; Washington Steel and Tin-Plate Mills, Washington, Pa., 4 mills.

The exports of pig iron from the United States for the ten months ending October 31st were somewhat smaller than last year, the total being 184,340 tons, against 198,789 tons last year. Bar iron and steel showed a very large increase, as did also wire. Steel rails exported this year were 246,430 tons, against 108,316 tons last year. Steel plates show a total export of 48,450,492 lbs., against 7,482,916 lbs. in 1897. The total value of iron and steel exports, including machinery, for the 10 months, was $67,290,500, an increase of $15,927,543, or 31%, over last year.

Buffalo, N. Y. Dec. 14.

(Special Report of Rogers, Brown & Co.)

The market continues very strong and quite active. Shipments, instead of being decreased, as local furnaces had hoped for, have actually increased, and to quite a material extent. Some furnaces tributary to this district have been compelled to withdraw from the market for delivery before next June from any one except old established trade. Furnaces in general are seriously handicapped by the scarcity of cars, which is inconveniencing many foundries. We quote for cash f. o. b. cars Buffalo: No. 1 strong foundry coke iron, Lake Superior ore, $11.50; No. 2 strong foundry coke iron, Lake Superior ore, $10.75; Ohio strong softener No. 1, $11.50; Ohio strong softener No. 2, $10.75; Jackson County silvery No. 1, $14; Southern soft No. 1, $12; Southern soft No. 2, $11.75; Lake Superior charcoal, $12@$12.50; coke malleable, $11.

Birmingham, Ala. Dec. 12.

(From Our Special Correspondent.)

The activity in the pig iron market, concerning which so much has been said in the last two or three months, seems to increase. The inquiries that are being received for the product in this district are far greater than the production, and already inquiries are being made for iron to be delivered as late as next August. The companies are not willing to book orders for delivery that long in the future at the prices that prevail at present, and this has led to the statement that all grades of iron have been advanced 25c. per ton. There are some companies in this district shipping a larger quantity of iron than they are making, depending on their yard supply, but as that source runs down, they can see nothing ahead but the warrant yards again, notwithstanding that the yards are moving their iron almost as rapidly as the furnaces.

Major Moody, of the Southern Iron Committee, says that shipments are enormous, and that one company sent out last month a greater amount of iron than it ever did before. The railroads are now furnishing more cars.

The establishment of a traffic manager, W. H. Applegate, in this district by Rogers, Brown & Co., the great iron brokers, is rather significant. Mr. Applegate stated that he was down there for no other purpose than to look after the traffic arrangements for his company. Their traffic arrangements heretofore have been looked after by the Tennessee Coal, Iron and Railroad Company, and later by W. L. Sims & Co. The business grew to such proportions that it was necessary to send an agent to establish an office here. It is believed the office will be permanent. The domestic trade as well as the foreign trade is very active, while there is much iron going out for export purposes.

The figures that are now being given with the 25c. advance are as follows: No. 1 foundry, $8; No. 2 foundry, $7.75; No. 3 foundry, $7.50; gray forge, $6.50 to $6.75; No. 1 soft, $8; No. 2 soft, $7.75.

There is talk of two furnaces being ready for blast soon after the New Year holidays. Workmen are now at work repairing one at Ensley City and one at Oxmoor. There are three furnaces in blast at Ensley City. Neither of the two furnaces at Oxmoor are in blast, and all the iron which was on the yards there has been worked off.

The finished iron market is holding its own. The two mills in this section are working steadily and are finding a ready sale for all their product. The prices are satisfactory. The meeting of stockholders of the Birmingham Rolling Mills Company discussing the arrangements for a settlement of affairs, held at Louisville, Ky., last week, seems to have been satisfactory to all concerned. A committee was appointed to make an investigation of all the affairs of the company, looking to a reorganization. Messrs. M. H. Smith, president of the Louisville & Nashville Railroad Company; George W. North, a broker of Louisville, and J. A. Van Hoose, of Birmingham, Ala., were named as the committee, and another meeting will be held whenever these gentlemen are ready to make a report.

The machine shops and foundries report continued active business. The Birmingham Machine and Foundry Works are being enlarged by the construction of another building. This will give them plenty of opportunity to accept any and all orders which might be extended. At other establishments of a similar character in the district, there is plenty of work on hand to keep the employees busy.

Cleveland, O. Dec. 14

(From Our Special Correspondent.)

Iron Ore.—No more has been done in the iron ore market during the past week than could be expected during the closing weeks of the year. For certain special purposes a few small sales were made, but outside of these transactions the agents have done practically nothing other than making arrangements for closing up the season's business. Up to the present time there has been no serious discussion relative to the business of next season. It is generally believed, however, that the representatives of the ore companies will be in the field for business earlier for the next season than they have been for several years past, as the outlook is more encouraging than it has been for a number of seasons. The last shipments of ore from the upper lake ports are now on their way down. The following prices for ore still prevail: Specular and magnetic ores, Bessemer quality, $3.25@$3.65; specular and magnetic ores, non-Bessemer quality, $2.50@$2.75; hematite ores, Bessemer quality, $2.55@$3.25; hematite ores, non-Bessemer quality, $2.10@$2.25.

Pig Iron.—The market has been fairly active during the past week. A number of fair-sized transactions in Bessemer metal are reported, and although the amounts involved were quite large, the sales were made at the highest quotation prices. In consequence the sellers believe that the prices will advance in the near future. Following are the quotations, f. o. b., Cleveland: Lake Superior charcoal, $11.75; Bessemer, $10.75@$11; No. 1 foundry, $10.65@$10.75; No. 2, $10.25@$10.50; No. 1 Ohio Scotch, $10.75@$11; No. 2, $10.25@$10.50; gray forge, $9.50@$9.75.

Philadelphia. Dec. 16.

(From Our Special Correspondent.)

Pig Iron.—Somewhat alarming conditions are developing in the iron trade and especially in the pig iron branch. The pressure for iron has depleted furnace stocks, despite the fact that production has been materially increased. A large week's business has been done at full prices. There is enough iron for all, but the upward tendency threatens to create a rush and a covering of future requirements. Reports from outside markets have a disturbing influence. A few brokers representing large furnace interests are in favor of an immediate advance. The actual requirements are enlarging, and as prices are hardening and stocks disappearing, something of a surprising nature is looked for. Quotations are: No. 1X foundry, $12@$12.50; No. 2X foundry,

$11@$11.25; No. 2 plain, $11.75; standard mill iron, $10.25@$10.50; ordinary, $10; basic, $10.25; Bessemer, $12@$12.50; low phosphorus, $17.

Billets.—A large amount of business will be done as soon as asking price reaches $17, although all buyers will not even say that much. Large orders are to be placed soon, but consumers will wait as long as they consider it safe.

Merchant Bars.—The pressure for common iron for car purposes is relieving the market in refined, and full prices are now the rule on small quick delivery orders. The improvement has been of short duration and hence manufacturers are anxious to get all the business at the former quotations. An advance will not be thought of until the mills are fuller. Common iron is 1.05c.; refined, 1.10@1.15c.; soft steel, 1.15@1.20c., and high grade bars, 1.20@1.30c.

Sheets.—A number of large users have lately come to the conclusion to buy for 1899 and the orders placed this week a little in advance of the usual time shows the temper of buyers and the improving tendency in prices.

Pipes and Tubes.—The pipe business is good for the season. Buyers are wisely deciding to place contracts before the new year. Manufacturers have been hitching prices up a little hgher on retail buyers without saying anything to attract the attention of consumers. Prices are very firm and mills are doing business as fast as they want it.

Merchant Steel.—This week's business has been light, but the mills are all oversold and prices for all kinds are firm except where an exceptionally large contract comes up.

Plates.—The big Australian order placed and the bigger order soon to come will help our custom mills and strengthen prices. The next big run of orders will come from the shipyards unless plans and intentions should be changed. At present there is a good retail business from small concerns, boiler makers and the like. Orders for large lots are placed at 1.30@1.35c. for plates and universals; 1.50@1.60c. for flange, and 1.75@2.50c. for firebox, according to the various qualities sold.

Structural Material.—All users of structural material are reported as engaged on specifications and that early in January some big orders can be counted on. The managers give an excellent account concerning 1899 prospects.

Steel Rails.—Local interests speak of great activity in other mills. Eastern makers are having their full share of Western trade. The rumor is again repeated that $17 has been slated. A large amount of business is looked for, owing to the hardening of crude material, and the oversold condition of most mills. A good many small buyers will want rails by spring and may have to pay more for them in consequence of waiting so long.

Old Rails.—The takings have been sufficient to keep rails at the top notch, especially in view of the fact that large lots will be definitely purchased in January. Quotations are $15@$15.50; steel rails, $10.50@$11.

Scrap.—Steel axles are wanted at $12. Good railroad scrap is held at $10.50@$11. The scrap trade has been benefited by the general improvement.

Pittsburg. Dec. 15.

(From Our Special Correspondent.)

Business since the first of the present month has been usually large, beating all previous records, and aggregating 323,675 tons. The entire sales for December, 1897, were 57,500 tons. The general impression was that large sales of raw material would be deferred until after the new year had been inaugurated, but by reference to last week's business it will be perceived that consumers made up their minds that delays might be costly, and at once entered the market and made the most liberal purchases of Bessemer we have ever reported; a single sale of Bessemer required a check in payment of $1,470,000. This shows that the outlook for 1899 is all that could be desired. At the same time no person can predict the magnitude; that it will exceed all previous years is beyond doubt. In the face of the largest output ever recorded, exceeding 1,000,000 tons a month, stocks for several months past have steadyily decreased while work under actual contract is undoubtedly very much larger than at any former time at this season of the year.

Besides this the position is immensely strengthened by an outside demand, the proportions of which are not appreciated as they ought to be. The immediate difficulty in making this outlet available is the difficulty of securing freight room.

The scarcity of pig iron and semi-finished steel in Great Britain and on the Continent is becoming a really serious matter, which is not alleviated by advancing prices on their own products, and will probably not be until they can get larger supplies of American material to help them out. This can only come by lower ocean freights, which will enable them to pay our prices, in addition to the heavy ocean freights.

Finished Material.—There is no change in this department and nothing special is looked for in the immediate future. Mills are well employed on old contracts, which is probably as much as ought to be expected at this season of the year; prospects are very good.

Muck bar firm, in good demand with sales $18.85.

Wire Nails.—The market is weak; this, however, is generally the situation at this season. Prices are low and irregular. Sales reported $1.25 for round lots with an advance on small amounts.

Sheet Bar.—The market ruled very firm at a further advance—closing at $17.50@$17.60.

Steel Rails.—The market was firm with large sales at most points, more particularly Pittsburg and Chicago; the requirements for 1890 being estimated at 2,000000 tons.

Ferro-manganese steady; sales imported $50, delivered.

Wrought Iron and Steel Pipe.—The plants in this vicinity are all employed to their full capacity; prices firm, but unchanged.

Latest.—The market rules very firm; last week beat all previous records. Total sales 323,450 tons. Bessemer Pittsburg very firm and advancing; sales at $10.65@$10.75; advance 20c. Sheet Bars advanced 50@75c; steel billets advanced 15c. to 35c.

Muck bar 15c. a ton higher. Such a demand at advanced prices was never known before at this time of the year. The end is not yet.

By Telegraph.

Pittsburg, December 16th.—The market is excited, with strong demand. Sales have just been made of 15,000 tons Bessemer pig, January-April delivery, at $10.25 at Valley Furnace; also of 10,000 tons Bessemer pig, Pittsburg delivery, at $10.75@$10.80 a ton. The prices of all iron and steel products are advancing.

COKE SMELTED LAKE AND NATIVE ORE.

Tons.	Cash.
6,000 B., D., J., V.	$10.00
5,000 B., J. to A., V.	10.00
5,000 B., J., F., P.	10 75
3,000 B., J., F., M., P.	10.75
2,500 M. I'n, D., J., F., P.	9 45
2,500 Mill I'n, D., J., V.	9.25
2 000 B., D., J., P.	10.65
2,000 Mill I'n, D., J., V.	9.25
2,000 Mill I'n, D., J., V.	9.40
1,800 B., F., M., V.	10.10
1,500 M. I'n, J., F., P.	9.40
1,000 M. I'n, J., F., V.	9.25
1,000 B., J., V.	10.10
250 Mill Iron, D., P.	9.25
250 B., prompt, P.	10.25
200 No. 1 F'y spc., P.	11.00
100 No. 2 F'dry, P.	10.30
50 No. 2 F'dry, P.	10 25
25 No. 2 F'dry, P.	10.25
25 No. 1 F'dry, P.	10.75

SHEET BARS.

3,000 Delivered, P.	$17.50
2,000 Delivered, P.	17.60

BLOOMS, BILLETS, SLABS.

5,000 Blts., Deliv., P.	$16.50
5,000 Blts., Deliv., P.	16.25
5,000 Blts., Deliv., P.	16.30
3,000 Blts., Deliv., P.	16.20
2,000 Blts., Deliv., P.	16.30
1,000 Blts., Deliv., P.	16 35
1,000 Blts., Deliv., P.	16 25

STEEL WIRE RODS.

2,500 Delivered, P.	$22.0

MUCK BAR.

5,000 N'l, J., F., M., P.	$18.85
500 Delivered, P.	19.00

FERRO-MANGANESE.

Tons	Cash.
250 80%, imp. dlv'd, P.	$50 00
25 80%, imp. dlv'd, P.	50 00

SKELP IRON

3,000 W. Gr'd, P.	$1.15 4 m.
800 N. Gr'd, P.	1.20 4 m.
500 Sheared, P.	1.32½ 4 m.
300 W. Gr'd, P.	1.20½ 4 m.

SKELP STEEL.

1,000 W. Gr'd, P.	$1.10 4 m
800 Sheared, P.	1.15 4 m
500 N. Gr'd, P.	1.00 4 m
350 W. Gr'd, P.,	1.00

CHARCOAL.

100 Cold Blast, P.	$2 .50
100 Warm Blast, P.	14.25
50 No 2 F'dry, P.	15.00
50 No. 3 F'dry, P.	14.75

BLOOMS BILLETS, BAR ENDS.

550 Blt. Ends, P.	$11.00

OLD IRON AND STEEL RAILS.

5,000 E. St'l R'ls, gr., P.	$10 65
2 000 Steel Rails, gr., P.	9.75
600 Iron Rails, gr., V.	13.75

SCRAP MATERIAL.

2,000 H'y St'l S'p, gr P.	$10.65
500 Bu. Scrap, net, P.	9.00
400 No. 1 W. S'p, nt., V.	11.50
300 No. 1 C. S'p, gr., P.	8.75
300 Cast B'ngs, net, V.	5.75
200 Wr't T'ngs, net, V.	6.75
200 O. Car W'ls, gr. P.	10.00

New York. Dec. 16.

The local market remains quiet with no prospects of change for several weeks. In foreign trade we note shipments of $25,380 worth of railway materials, $15,000 worth of iron pipe, $39,100 worth of mining machinery and $19,200 worth of manufactured iron to South Africa; heavy shipments of railway material to Argentina; some good shipments of wrought iron pipe to England; shipments of $10,000 worth of sugar machinery to Cuba, some good-sized orders for machinery and hoisting engines from Mexico, and a shipment of $30,000 worth of mining machinery to Australia.

Pig Iron.—Furnaces are well sold up, prices are firm and advancing. Sellers appear confident that the higher figures are likely to rule for some time. We quote: Northern brands, tidewater delivery, No. 1 X foundry, $11.50@$11.75; No. 2X foundry, $10.75@$11.25; No. 2 plain, $10.50@$10.75; gray forge, $10@$10.50. Southern brands, New York delivery: No. 1 foundry, $11.25@$11.50; No. 2 foundry, $10.75@$11; No. 1 soft, $11@$11.25; No. 2 soft, $10.75@$11; No. 3, $10.50@$10.75; basic, $10.50@$10.75.

Bar Iron and Steel.—The market is dull. We continue to quote for large lots on dock: Common, 1.05@1.10c.; refined, 1.15c. Soft steel bars, 1.10@1.20c.

Plates.—The local market is rather quiet, though prices are advancing. We quote: For sheared plates at tidewater, in large lots: Tank, ¼-in. and heavier, 1.25@1.30c.; 3-16-in., 1.35@1.40c.; Nos. 8, 9 and 10, 1.45@1.50c. Shell is as high as 1.35@1.40c.; flange, 1.45@1.55c.; marine, 1.60c.; firebox, 1.65@1.70c. Universals are 1.30c.; charcoal iron plates, 2.25c. for shell, 3.75c. for flange, and 3.25c. for firebox. Rivets are 2.25c. for iron and 1.75@1.85c. for steel.

Structural Material.—No large contracts have been placed recently. We quote for large lots at tidewater: Beams, 15-in., 1.35@1.45c.; angles, 1.25@1.30c.; tees, 1.45@1.50c.; channels, 1.40@1.50c.

Nails.—There is only a fair demand. We quote for large lots on dock: Cut nails, $1.30; wire nails, $1.40.

Wrought Iron Pipe.—The local market is very dull. Foreign trade is better.

Old Material.—Scrap continues in good demand. Quotations are: Old steel rails, $9.50; old iron rails, $12; old car wheels, $10; axles, $15 @$16; wrought iron scrap, $10; machinery, cast, $9.50; borings, $5; turnings, $6; burnt iron, $5.25; all New York deliveries.

METAL MARKET.

NEW YORK, Dec. 16, 1898.

Gold and Silver.

Gold and Silver Exports and Imports

At all United States ports, November and year from Jan. 1.

	November.		Eleven Months.	
	1897.	1898.	1897.	1898
GOLD.				
Exports	$699,513	$913.467	$33,698,405	$14,975.316
Imports	3,054 089	5,825,201	31,440,407	149.396,370
Excess	I. $2,354.576	I. $4,911,734	E. $2,257,998	I$134,421,054
SILVER.				
Exports	4,980,651	4,023,079	52,812,762	47,969,406
Imports	3,150,836	2,268,635	30,315,576	25.921,303
Excess	E. $1,829,815	E. $1,754,444	E $22,497 246	E. $22,048,103

This statement includes the exports and imports at all United States ports, the figures being furnished by the Bureau of Statistics of the Treasury Department.

Gold and Silver Exports and Imports, New York

For the week ending Dec. 16th, 1898, and for years from January 1st. 1898, 1897, 1896, 1895.

Period	Gold.		Silver.		Total Excess, Exp. or Imp.
	Exports.	Imports.	Exports	Imports.	
We'k	$166,430	$1,304,458	$850,800	$101,827	I. $389,055
1898..	8,600,024	98,157,691	33,023,503	3,109,952	I. 59,644,116
1897..	29,793,881	43,207,861	14,954,478	3,024,733	I 1,478,235
1896..	40,713,498	76,607,504	35,762,416	3,501,040	I. 3.702,630
1895	69,296,652	28,914,694	36,560,438	1,612,869	E. 75,259,527

Imports of gold were chiefly from Europe; of silver from South America. Exports of gold were to the West Indies; of silver to London.

The United States assay office in New York reports the total receipts of silver at 88,000 oz. for the week.

Financial Notes of the Week.

Business activity is increasing and the speculative markets have been in rather an excited condition this week. The continued heavy exports shown below, and the large balances upon which we can draw as needed, are having their natural effect. Money is in abundant supply and there is every reason to expect a continuance of this condition. At the same time there is more caution about new enterprises than might have been expected. No gold imports are reported at New York this week, but gold to the amount of $3,510,000 was received at San Francisco from Australia.

An improvement in the China exchanges incident to their New Year settlements has created a demand for silver for that quarter, and prices have slightly improved, with active business for shipment on Chinese account.

The statement of the United States Treasury on Thursday, December 15th, shows balances in excess of outstanding certificates as below, comparison being made with the statement for the corresponding date of last week:

	Dec. 8.	Dec. 15.	Changes.
Gold	$244,088,719	$245,475,319	I. $1,386,600
Silver	6.842,551	6,634,035	D. 208,516
Legal tenders	14,972,531	14,020,651	D. 951,880
Treas. notes, &c..	1,057,619	1,000,381	D. 57,228
Totals	$266,961,420	$267,130,886	I. $169,466

Treasury deposits with national banks amounted to $96,301,717, a decrease of $87,344 during the week.

Exports of merchandise in November reported by the Bureau of Statistics were the largest ever reported in one month, reaching the great total of $129,783,512. For the eleven months ending November 30th the statement is as follows:

	1897.	1898.
Exports	$974,655,084	$1,117,681,199
Imports	691,089,266	579,844,153
Excess, exports	$283,565,818	$537,837,046
Add excess of exports, silver		22,048,103
Total		$559,885,149
Deduct excess of imports, gold		134,421,054
Apparent balance		$425,464,095

The movement of gold and silver in detail will be found in the usual place, at the head of this column.

The statement of the New York banks—including the 66 banks represented in the Clearing House—for the week ending December 10th gives the following totals, comparison being made with the corresponding weeks in 1897 and 1896:

	1896.	1897.	1898.
Loans and discounts	$483,503,500	$607,725,300	$702,309,300
Deposits	516,605,000	675,149,900	796,788,000
Circulation	19,841,300	15,854,200	16,385,300
Reserve:			
Specie	76,648,100	103,879,900	161,066,500
Legal tenders	84,109,500	83,800,000	54,873,800
Total reserve	$160,757,600	$187,679,900	$215,940,300
Legal requirement	129,151,250	168,792,475	199,197,000
Balance surplus	$31,606,350	$18,887,425	$16,743,300

Changes for the week this year were increases of $4,561,900 in loans and discounts, $7,262,200 in deposits, and $2,604,200 in specie; decreases of $53,900 in circulation, $1,143,300 in legal tenders, and $354,650 in surplus reserve.

Exports of specie from San Francisco in November were light, including $303,646 silver and $3,234,555 gold. For the eleven months ending November 30th the shipments were as follows:

	Gold.	Silver.	Totals.
Hong Kong	$67,711	$5,793,145	$5,860,856
Shanghai	.....	196,578	196,578
Japan	.....	3,000	3,000
India	.....	415,900	415,900
Tahiti	2,411	.....	2,411
Honolulu	670,000	82,000	752,000
Central America	27,425	103,957	131,382
Mexico	500	.....	500
Total foreign	$768,047	$6,594,580	$7,362,627
New York	41,919,238	13,050	41,932,288
Totals	$42,687,285	$6,607,630	$49,294,915
Totals, 1897	25,401,468	15,334,539	40,736,097

The silver exports included $264,096 in Mexican dollars in November and $4,032,385 in the 11 months. These figures compare with $1,738,525 and $9,914,587, respectively, last year.

The following table shows the specie holdings of the leading banks of the world at the latest dates covered by their reports. The amounts are reduced to dollars, and comparison is made with the holdings at the corresponding dates last year:

	1897.		1898.	
Banks.	Gold.	Silver.	Gold.	Silver.
N. Y. Asso.	$103,859,900	.....	$161,066,500	.....
England	158,788,740	.....	154,944,395	.....
France	392,699,860	$241,776,837	365,416,900	$241,932,400
Germany	143,545,000	73,945,000	128,655,000	66,285,000
Aus.-Hun.	189,815,000	61,970,000	177,040,000	62,355,000
Spain	46,275,000	55,150,000	55,310,000	32,790,000
Belgium	14,140,000	7,070,000	15,365,000	7,685,000
Netherlands	13,140,000	33,630,000	21,570,000	33,530,000
Italy	79,250,000	11,315,000	74,890,000	11,650,000
Russia	579,955,000	19,515,000	497,615,000	18,475,000

The returns for the Associated Banks of New York are of date December 10th, the Banks of England and France December 15th, and the others are of date December 8th, as reported by the "Commercial and Financial Chronicle" cable. The New York banks do not report silver separately, but the specie carried is chiefly gold coin. The Bank of England reports gold only.

Shipments of silver from London to the East for the year up to December 1st are reported by Messrs. Pixley & Abel's circular as follows:

	1897.	1898.	Changes.
India	£5,101,656	£3,978,365	D. £1,123,291
China	364,512	577,969	I. 213,457
The Straits	572,607	365,541	D. 207,066
Totals	£6,038,775	£4,921,875	D. £1,116,900

Arrivals for the week this year were £215,000 in bar silver from New York, £34,000 from Chile, and £22,000 from the West Indies; total, £271,000. Shipments were £900 in bar silver to Bombay.

Indian exchange continues firm and all the Council bills offered in London were taken at an average of 15.97d. per rupee. Money in India is plentiful, but exports continue on a large scale.

Active speculation and overtrading in Germany have culminated in something approaching a crisis. Money commands very high rates, and an actual stringency has been avoided only by heavy borrowing in London, Paris and New York. The banks have been able to meet the emergency, but there will probably be a good deal of cutting down in business during the next two or three months.

Daily Prices of Metals in New York.

December	Sterling Exchange.	Silver. Fine oz. Cts.	Silver. London, P'nce	Copper. Lake, cts. ₱ lb.	Copper. Elec-tro-lytic, ₱ lb.	Copper. Lond'n stand-ard £ ton.	Tin, cts. ₱ lb.	Lead, cts. ₱ lb.	Spel-ter cts. ₱ lb.
10	4.84¼	59½	27½	12¾	12½	.....	18⅛	3 62½	5.20
12	4.84¼	59⅜	27⅞	12¾	@12⅝	55 5 0	18⅛	3.65	5.15
13	4.84¼	59⅜	27⅞	@12⅞	"	55 10 0	18	3.67½	5.15
14	4.84¼	59½	27⅞	"	"	55 2 6	17⅝	3.70	5.10
15	4.84¼	59½	27½	"	"	55 2 6	18	3.75	5.07½
16	4.84¼	59⅜	27⅞	"	"	55 7 6	18	3.77½	5.07½

Average Prices of Silver per oz. Troy.

Month.	1898. Lond'n Pence.	1898. N. Y. Cents.	1897. Lond'n Pence.	1897. N. Y. Cents.	1896. Lond'n Pence.	1896. N. Y. Cents.
January	26.29	56.77	29.74	64.79	30.69	67.13
February	25.89	56.07	29.68	64.67	31.01	67.67
March	25.47	54.90	28.96	63 06	31.34	68.40
April	25.95	56.02	28.36	61.85	31.10	67.92
May	26.31	56.98	27.86	60.42	31.08	67.88
June	27.09	58.61	27.58	60.10	31.46	68.69
July	27.32	59.06	27.36	59.61	31.45	68 75
August	27.48	59.54	24.93	54.19	30 93	67.34
September	28.05	60.68	25.66	55.24	30.19	65.68
October	27.90	60.42	26.77	57.57	29.68	65.05
November	27.93	60.60	26 87	57.93	29.46	64.98
December	.....	.....	26.83	58.01	29.70	65.24
Year	.....	.....	27.55	59.79	30.67	67.06

The New York prices are per fine ounce; the London quotation is per standard ounce, 925 fine.

Average Prices of Metals per lb., New York.

Month.	Copper. 1898.	Copper. 1897.	Tin. 1898.	Tin. 1897.	Lead. 1898.	Lead. 1897.	Spelter. 1898.	Spelter. 1897.
Jan	10.99	11.75	13.87	13.44	3 65	3.04	3.96	3.91
Feb	11 28	11.92	14 08	13.59	3.71	3.28	4.04	4.02
March	11.98	11.80	14.38	13.43	3.72	3.41	4.25	4.12
April	12.14	11.48	14.60	13.34	3.63	3.32	4.26	4.13
May	12.00	11.03	14.52	13.44	3.64	3.26	4.27	4.21
June	11.89	11 11	15.22	13.77	3.82	3.33	4 77	4.24
July	11.63	11.11	15.60	13.89	3.95	3.72	4.66	4.32
August	11.89	11.16	16.23	13.80	4.00	3.84	4.58	4.26
Sept	12.31	11.30	16.03	13.98	3.99	4.30	4.67	4.18
October	12.41	11.13	17.42	13.88	3.78	4 00	4.98	4.17
Nov	12.86	10.88	18.20	13.79	3.70	3.76	5.29	4.03
Dec	.....	10.78	.....	13.71	.....	3.70	.....	3 89
Year	.....	11.29	.....	13.67	.....	3.58	.....	4.12

Prices of Foreign Coins.

	Bid.	Asked
Mexican dollars	$ .46¾	$ .47⅛
Peruvian soles and Chilean pesos	.42¾	.43
Victoria sovereigns	4.84	4.87
Twenty francs	3.84	3.88
Twenty marks	4.73	4.78
Spanish 25 pesetas	4.78	4.84

Other Metals.

Copper has been quiet throughout the week, business being restricted to immediate wants. Prices, however, have remained fairly steady and in some instances have been even a little better than when we last went to press. We quote Lake, 12¾@12⅞c.; electrolytic in cakes, wirebars or ingots, 12½@12⅝c.; cathodes, 12.40@12.50c., and casting copper 12⅜@12½c.

The foreign market has not fluctuated so widely as was the case during the few previous weeks, except one day, when the quotation advanced 10s., which improvement, however, was lost the next day, and the closing price for standard copper spot is £55 7s. 6d.@£55 10s., and £55 12s. 6d.@£55 15s. for three months prompt. Very little business has been transacted in the better grades of copper, consumers holding off with purchases, and especially so as far as the Continent is concerned, where business does not appear to be quite so brisk as it has been, probably on account of the serious stringency prevailing in that quarter in connection with the money market. We quote refined sorts: English tough, £58 5s.@£58 10s.; best selected, £59@£59 10s.; strong sheets, £66; India sheets, £62 10s.; yellow metal, 5¾d.

According to our table, copper statistics for the first half of the month show no change.

Copper production, as reported by Mr. John Stanton, who acts as statistician for the companies, was as follows for November and the eleven months ending November 30th, in long tons (2,240 lbs.) of fine copper:

	November. 1897.	November. 1898.	Eleven months. 1897.	Eleven months. 1898.
U. S. reporting mines	16,227	18,050	183,115	199,590
U. S. outside sources	1,200	1,800	10,700	16,200
Total, U. S.	17,427	19,850	193,815	215,790
Foreign reporting mines	7,073	7,081	80,275	76,118
Totals	24,500	26,931	274,090	291,908
Exports, U. S.	9,294	14,741	118,269	131,893

The United States production, as reported, shows an increase this year of 17,818 tons, and the exports a gain of 13,614 tons. It must be remembered that a part of these increases is due to the output of the Boleo Mine in Lower California, which is now shipped through the United States ports, and included in our production and exports. This Boleo production has amounted probably to about 8,500 tons this year.

Exports of copper from New York for the week amounted to 2,086 long tons and 104 tons matte. Imports were 531 tons copper. From Baltimore the shipments aggregated 135 long tons.

Tin has been in somewhat better demand, but the business has not been brisk enough to keep values from sagging, the closing price to-day being 18c. for both spot and futures.

The London market opened at £82 for spot, declined subsequently to £81, from which it recovered slightly, the closing price to-day being £81 7s. 6d.@£81 10s. for spot, and £82@£82 2s. 6d. for three months prompt.

Imports of tin at New York this week amounted to 50 long tons.

Lead has been the most active metal on the list, there having suddenly sprung up an unprecedentedly large demand for this season of the year, when business in lead articles is usually very much restricted. The supplies of lead at hand not having been very liberal, the price advanced considerably, the last reports being to the effect that there are buyers at 3.75@3.77½c. in New York and 3.65c. in St. Louis, and the offerings, notwithstanding the improvement, still of a very scant nature. Transactions have been fairly large and are estimated to have amounted to at least 3,000 tons, and they would probably have been larger except for lack of supplies.

The London market, on the other hand, does not reflect this firmness, the price there having receded to £13 for Spanish and £13 3s. 9d. for English lead. Business there is falling off, as it apparently is in all metals.

Exports of lead in bond from New York for the week were 750 long tons, and imports 20,739 bars bullion.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is strong and largely higher. The latest sales are on a basis of 3.62½c. for common metal and 3.65c. for corroding lead. The demand is fairly active.

Spelter.—The easier tendency has made further progress, not so much on account of a falling off in consumption in this country, which on the contrary continues on as large a scale as ever, but as the result of more of a disposition on the part of smelters to sell their product for forward delivery, a willingness, no doubt, actuated by the decline in ore prices, the same, according to the latest reports, having receded from $40 to about $34 per ton.

The foreign market to-day is somewhat easier, and although the metal is still quoted at £24, that price seems to be in operation only for spot delivery, there being no buyers at all for anything beyond.

Imports of spelter at New York this week aggregated 25 long tons.

Antimony.—No change: 9¼c. for Cookson's; 8¾@8⅞c. for U. S. Star, Hallett's and Japanese.

Nickel continues on unchanged lines, and no alteration in prices can be reported. We quote for ton lots 33@36c. per lb., and for smaller orders 35½@38c. London prices are 14@16d. per lb., according to size and order.

Platinum.—Demand is steady. The metal can be had in large lots at $14.40; for smaller orders it is quoted at $15@$16 per oz. in New York. The London quotation is 58@60s. per oz. Prices are firm.

For chemical ware (crucibles and dishes), best hammered metal, current prices in New York are as follows: In lots of 250 grams or more, 56c. per gram; in lots of 100 grams, 58c. per gram; less than 100 grams, 60c. per gram; unmanufactured platinum will be supplied in small quantities at 2c. less per gram.

The Minor Metals.—Quotations are given below for New York delivery:

	Per lb.		Per lb.
Aluminum.			
No. 1, 98% ingots	33@40c.	Bismuth	$1.40
No. 2, 90% ingots	31@34c.	Phosphorus	40@65c.
Rolled sheets	38c. up	Tungsten	70c.
Nickel alloy	33@39c.	Ferro-tungsten, 60%	60c.

Variations in price depend chiefly on the size of the order.

Quicksilver.—The New York quotation continues unchanged at $41 per flask. The London price is £7 15s. a flask, with £7 14s. named for second hands.

Quicksilver receipts at San Francisco in November were 1,483 flasks. For the eleven months ending November 30th they were 20,945 flasks, against 16,037 in 1897. The shipments by sea for the eleven months were: New Zealand, 30 flasks; South America, 10; Central America, 1,361; Mexico, 4,127; British Columbia, 106; New York, 135; total, 5,769 flasks, against 4,913 last year.

MINING STOCKS.

Complete quotations will be found on pages 746, 747 and 748 of mining stocks listed and dealt in at:

Baltimore.	New York	Mexico.
Boston.	Philadelphia	Paris.
Cleveland.	Pittsburg.	Rossland.
Colo. Springs.	St. Louis.	Shanghai.
Denver.	Salt Lake.	Toron'o.
Helena.	San Francisco.	Valparaiso.
	London.	

New York. Dec. 16.

Locally the mining share market is stagnant. On the Consolidated Exchange the Comstocks have fallen from 10 to 15c.

In the Colorado group both the Cripple Creek and Leadville stocks are featureless. Portland pays the usual $60,000 monthly dividend, and in this market it is quoted at $1.40. Cripple Creek Consolidated has bidders at 8c. This company held its annual meeting recently, and out of a capitalization of 2,000,000 shares there were represented 1,219,948 shares. The Treasurer's report showed that the company still had a cash reserve of $7,308. The expenses for the year amounted to $17,762, and the receipts from ore shipped, royalties, etc., to $8,433, showing a loss of $9,329, which, deducted from the cash, $16,637, on hand at the beginning of the year, left $7,308 as above.

Of the California stocks Standard Consolidated was quoted at $1.75 on the Stock Exchange, following the report that the company's tailings product in November amounted to $5,400. The Quicksilvers are strong and several hundred shares of the preferred stock were sold at $7.75@$10 per share.

Homestake, of South Dakota, although $56 had been bid for it on the Exchange, 100 shares were sold at auction at $58. Deadwood Terra, which has been quoted at 45@50c. on the Consolidated Exchange, was sold at auction on December 14th at 75c., 400 shares changing hands.

In the Utah stocks Horn Silver will pay its fourth dividend of 5c. per share on December 31st; the stock is quoted at $1.15 to-day. Ontario, usually quoted around $5.50, has been sold at auction at $6.50, 30 shares having been traded.

Of the miscellaneous dividends declared this week we note the Exploration Syndicate, regular quarterly of $2.50 per share, payable in New York on December 31st, and the Texas Pacific Coal Company, 1¼ per cent., payable January 20th, 1899.

Auction sales included 25 shares preferred stock of the Joseph Ladue Gold Mining and Development Company, at $6.50 per share, and seven shares of the Pennsylvania Coal Company at $356¼.

The Mining Exchange has listed its first miscellaneous stock—the Marshall Stamp Mill Company; capitalization, $250,000, and par value $1. The stock sold at 55c. This is a pneumatic stamp mill, patented and manufactured by John W. Marshall, of Brooklyn, N. Y.

Boston. Dec. 15.

(From Our Special Correspondent.)

Trading in the copper stocks has continued large throughout the week on a very active and buoyant market, though there has been much less excitement than in recent weeks. It is noticeable, also, that the steady going investment stocks have been rather neglected, the tendency being towards the new stocks, so many of which have only a speculative value. Such shares as Adventure, Arcadian, Old Dominion, Isle Royal and Centennial have the call just now, and are relatively very much higher than the steady dividend payers. Butte & Boston, of course, is in a class by itself, and is traded in accordingly, bringing a high price for reasons which no one knows exactly; but every one buys, because there is a general impression that it will go higher.

Boston & Montana has been rather heavy and fell off $7 to-day, closing at $233. A dispatch saying that the court in Butte had appointed a receiver for the company in the suit to enjoin the transfer of the new corporation was received too late to affect the market. Very little importance is attached to it here.

Butte & Boston kept at nearly the same level through the week, the highest being $68, with $66¾ given at the close.

A little more was done in the gold stocks. North American Gold Dredging was in some demand, selling to-day at $18. It is said that Cochiti shares will be listed soon; meantime there is an evident effort to work up a boom in this stock.

For the first time in several weeks there were dealings in quicksilver stocks, Napa Consolidated selling at $7¾ and New Idria at $8½.

Dominion Coal has been strong again, notwithstanding a determined effort to force it down, and closes at $33½. Federal Steel has been rather neglected this week.

This week the Fortuna Gold Mining Company (of Lower California) offered 100,000 shares of $1 each. The total stock is $1,000,000. It is understood that the shares were taken at about 50 cts.

Salt Lake City. Dec. 10.

(From Our Special Correspondent.)

It is well to look things in the face whether one likes the appearance or finds his theories corroborated or not. Utah mining share trading has taken on a bull look, and the pyrotechnic prices savor too strongly of manipulation for a healthy condition. This applies more especially to the non-dividend sensations, which are trotted out and put through their upward paces in turn. Generous buying orders continue; a large part being for a quick speculation, and shares are pushed higher and higher. A general profit-taking movement would bring about falling prices. This right about face may come with startling suddenness.

Grand Central has taken another leap. Three weeks since it could be had for $7.25; to-day it closed very firm, $9.10 bid, $9.50 asked, though nothing new has occurred at the mines. The regular $31,500 dividend was paid to-day. Swansea holds strong, $3.65 bid, $3.80 asked. Centennial-Eureka has again entered the dividend list, paying 50c. per share December 15th. Mammoth has moved up to $2.10. Four Aces rose to 45c., closing a little off, during a brisk business this morning, at 41½@42½c. Bullion Beck sold above $5. It has not yet participated in the boom. The $10,000 December dividend is announced this afternoon, payable on the 20th. Star Consolidated, a new Tintic favorite a month ago, was an offering at 60c., and to-day is strong at $1.36½ bid. Silver King folk have gone into it. Lower Mammoth has moved up and down in a way to content the most ardent speculator, doing a large business, and ending the week strong at 73½c. Sunbeam is strong around 10c. Homestake's big advance is an unexplainable fluke.

Mercur sold up to $8. It has caught on to the boom, and more shares are going East. Another advance is likely, as the last development in Lulu ground exposed a big body—40 ft. thick—of good grade ore, though largely base, requiring roasting before cyaniding. The $25,000 dividend will be paid December 20th. Geyser-Marion fluctuated wildly, ending with a strong upward spurt. Yesterday it sold at 71c.; to-day it closed on call 85c. bid, 87c. asked, and sold late this afternoon at 90c. Report is that terms of settlement, involving half ownership of the Geyser claim, are agreed upon, but no particulars are obtainable. Northern Light about holds the advance, and does a big business. Chloride Point is a few points higher. Little Pittsburg is climbing, and has gone up about 300% in four weeks. Eagle is lower and in less demand.

Ontario is stronger and quietly inquired for. Silver King sold for $31.50, a new record. The $37,500 dividend was paid to-day. Anchor retains the strength of last week. Daly is in much better form. Daly West is quiet. Valeo did business to-day at $1.37½@$1.39. While lower than ten days ago, it holds in favor and is a very active trader.

Dalton was the surprising seller of the week, bounding from ½c. to 3c., reacting to 2c. There is no warrant for this spurt. The mines show considerable low grade gold ore, but the treatment problem is not easy. Dexter is again stronger and higher. With its debt of fully $100,000, and a moderate winter campaign at the mines in prospect, this forecast seems humorous. Galena fluctuated, refusing to boom in spite of flattering accounts of new ore finds. Utah holds its advance, and there are more intimations of dividends. Dalton & Lark has moved up, possibly due to the movement to work its deep placer ground. Horn Silver is a shade higher. The quarterly dividend is looked for the end of the month.

I have been asked to make a statement of the Utah Consolidated Gold Mines, Limited, which shares, my inquirer writes, are attracting attention in London mining circles. This company owns the stock of the Highland Boy Gold Mining Company and other shares. The Highland Boy is a valuable copper-gold mine, at Bingham, with many thousand tons of choice ore blocked out, and 10 miles south of Salt Lake City the company is erecting the largest, most modern and best equipped smeltery in Utah, to treat its own ores and for custom work.

San Francisco. Dec. 10.

(From Our Special Correspondent.)

Trading during the past week has been a little more active, but it is still mainly an insiders' market, and we do not see the promised rush of orders. Popular confidence in the purpose of the Comstock managers to do some actual work this time does not seem very strong as yet.

Taking such market as there was, sales were fair, with but little change in prices, though at the close quotations were easier, with rather a downward tendency.

Some quotations noted are: Consolidated California & Virginia, $1.30; Sierra Nevada, $1@$1.05; Ophir, 61c.; Best & Belcher, 41c.; Mexican, 31@32c.; Gould & Curry, 28c. With the $1.50 dividend off Hale & Norcross lost much of its recent price and sold at 16@19c. There were a few sales of Standard Consolidated at $1.75.

It is understood that as the legal troubles are now in a fair way to settlement the Hale & Norcross Mining Company will take the necessary steps to reduce its capital, in line with the other companies of the Comstock. This will be done by reincorporation. A new company will be formed with the same number of shares (112,000) as the present one, but the total amount of capital will be $336,000, instead of $11,200,000, and the par value of the shares will be $3 each, instead of $100, as at present. The property of the old company, its rights, etc., will be deeded over to the new company and the directors and officers will be the same.

London. Dec. 7.

(From Our Special Correspondent.)

The long expected Le Roi issue has at last made its appearance. As indicated in my letter last week, the capital of the new company is £1,000,000, but the purchase price is fixed at £950,000, instead of £850,000, the figure mentioned by me. The Stock Exchange gave Mr. Whitaker Wright such encouragement that the higher figure was as easily asked for as the other, and no doubt if he had proposed £1,250,000 he would have got it with no trouble at all. According to this arrangement £50,000 will be available as working capital, and the cost of developments will come out of income. In a large concern of this sort, a substantial banker's balance is necessary, so no doubt the profits will be allowed to accumulate for a short time with this object in view. To go into details of the flotation, the company is called the Le Roi Mining Company, Limited; its capital is £1,000,000 in 200,000 shares of £5 each. The shareholders in the two promoting companies, the London & Globe Finance Corporation and the British America Corporation, will have preferential allotments. The directors are Lords Dufferin and Loch, who are directors of the London & Globe and the British America corporations; Mr. Whitaker Wright and Mr. H. H. Andrew, a Sheffield steel man. The shares are issued at par value. Reports are given by Mr. Carlyle, Messrs. J. Breen, J. M. Long, D. J. Macdonald, N. T. Tregear and E. P. Rathbone. None of these enter into great details, but they estimate a minimum production of 400 tons a day, which will give £20,000 per month profit, though it is not quite clear whether this allows for expenditure on developments. Of course the capital will be over-subscribed.

Last week I gave particulars of the internal dissensions on the board of the Sulphide Corporation (Ashcroft's process), Limited. The representatives of the Exploration Company (Messrs. Lukach, McDermott and Matesdorf) and the representatives of the Australian section of the promoters, Gibbs Bright & Company, and their friends were divided into two opposing camps, and both asked the shareholders to give them control. At the meeting held this week both sides gave long speeches, and the matter was put to vote. The Exploration Company came off second best, as I expected, and the Gibbs party were triumphant. It would not be surprising to hear that Messrs. Lukach, McDermott and Matesdorf had been asked to resign their directorships, for the personal animus has been very strong. In any case, Mr. T. A. Allan will be appointed manager in Australia. Mr. Allan has investigated many new processes for treating the sulphides, some of which processes are intended to radically alter the system of concentration now in vogue, and others of more specific application to help dispose of products which are not at present profitable. Details of Mr. Allan's intentions are kept secret, but will doubtless be made public shortly.

Paris. Dec. 4.

(From Our Special Correspondent.)

So far as the mining stock markets are concerned there are few matters of interest to report and business continues quiet. This must be the condition of affairs until home and foreign politics assume more settled conditions than have recently been apparent.

While there is still as much interest in the metallurgical shares as in any section of the market, the copper shares have shown the greatest fluctuations. Generally the changes have been downward, though they have not been considerable. It seems doubtful whether the present high prices of the metal can be maintained; and if they are a larger increase in production will follow.

The stockholders of the Societe le Nickel have voted to increase the capital stock from 6,360,000 fr. to 10,000,000 fr. by the issue of 14,560 new shares of 250 fr. each. The present stockholders will have the option of subscribing for the new shares before any are offered to the public. The proceeds of the issue, together with 760,000 fr. from the company's reserve, will be used to pay off the outstanding 5% and 6% obligations of the company.

It is not probable that there will be any revival of interest in the mining stock market before the Christmas and New Year holidays. After that, it depends on political conditions. What these may be in January it is not easy to predict.

Azote.

MISCELLANEOUS DIVIDENDS.

Dominion Coal Company, 4 per cent. semi-annual on the preferred stock, payable January 2d, 1899, to stockholders of record December 20th, 1898.

LATE NEWS.

UTAH.

(From Our Special Correspondent.)

On Saturday, December 10th, it was quietly noised about that terms of agreement were arrived at, by the attorneys on each side, in the settlement of the suit involving half ownership in the Geyser Claim, but no particulars were given. Two days later it was learned that the suit is to be settled for $26,000, of which $6,000 is to be paid by Mr. Gisborn, and four monthly payments, each of $5,000, are to be made by the Geyser-Marion Mining Company, when it will have a clean title to the tract in question. The shareowners are to be congratulated, more especially as this is the last of the litigation troubles over titles, which have proved a wet blanket for more than three years. The mines are reported as showing a marked improvement, but it will require some months before any considerable reserves are blocked out. Meanwhile the mill is running regularly, sending forward the usual consignment of cyanides every three weeks or so.

STOCK QUOTATIONS.

NEW YORK.‡

Name of Company.	Location.	Par val.	Dec. 10. H.	Dec. 10. L.	Dec 12. H.	Dec 12. L.	Dec. 13. H.	Dec. 13. L.	Dec. 14. H.	Dec. 14. L.	Dec. 15. H.	Dec. 15. L.	Dec. 16. H.	Dec. 16. L.	Sales
Adams Con	Colo.	$10	.09	..	.08	..	....	..	.09	..	....	....	....	....	1,800
Alamo	"	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Alice	Mont.	25	.80	.75	.80	.75	.80	.75	.82	.75	.82	.75	....	....	....
American Flag	Colo.	1	....	....	....	....	....	....	....	....	....	....	....	....	....
American Gold	"	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Anaconda Gold	"	5	.51	....	....	....	.59	....	....	....	....	....	....	....	1,600
Andes	Nev.	3	....	....	....	....	....	....	....	....	....	....	....	....	....
Argentum-Jun.	"	2	....	....	....	....	....	....	....	....	....	....	....	....	....
Best & Belcher	"	3	....	....	.38	....	.38	....	.33	.30	.40	....	....	....	400
Belcher	"	3	.21	....	.21	.20	.21	....	.15	....	.15	....	....	....	....
Breece	Colo.	25	.85	....	.85	....	.80	....	.90	.80	.90	....	....	....	25
Brunswick	Cal.	1	.13	.10	.10	....	.13	.10	.14	....	.14	....	....	....	....
Caledonia	S. D.	..	.50	....	.50	....	....	....	.50	....	.50	....	....	....	....
Cannon Ball	Colo	1	.0025	....	....	....	.002	....	.002	....	.002	....	.004	.002	....
Challar	Nev.	3	.20	....	.22	.20	.22	.17	.21	.17	.17	....	....	....	....
Chrysolite	Colo.	50	.13	.12	.13	.12	.13	.12	.14	.12	.13	.12	....	....	....
Con. St'k T. J'd's	Nev.	100	.04	....	.04	....	.04	....	.04	....	.04	....	....	....	....
do. stocks	"	100	.04	....	.04	....	.04	....	.04	....	.04	....	....	....	....
do. scrip	"	100	.04	....	.04	....	.04	....	.04	....	.04	....	....	....	....
Con. Cal. & Va	"	2½	1.25	1.20	1 40	....	1 25	....	1 15	....	1 15	1.00	....	....	800
Con Imp	"	1	....	....	.03	....	....	....	....	....	....	....	....	....	....
Copper Rock	Colo.	1	.03¼	....	....	....	.03¼	....	.03¼	....	....	....	....	....	....
Cr. & Cr. Creek	"	1	.06	....	.06	....	.04	....	.05	....	.06	....	....	....	1,700
Crescent	"	10	.08	....	.08	....	....	....	....	....	.08	....	....	....	....
Cripple Cr. Con.	"	1	....	....	....	....	.08	....	.08	....	....	....	....	....	....
Crown Point	Nev.	3	.15	....	....	....	.15	....	.15	....	.13	....	....	....	....
Deadw'd Terra	S. Dak	25	.45	.40	....	....	.45	.40	.40	....	....	....	....	....	....
Elkton Con	Colo.	1	.85	....	....	....	.85	....	....	....	1 80	.72	....	....	100
Enterprise	"	1	.36	....	.36	....	.36	....	....	....	....	....	....	....	....
Fath'r de Smet	S. Dak	100	.16	.10	.16	.10	.16	.10	.16	.10	.17	....	....	....	....
Garfield Con.	Colo	1	.12¾	....	.12	....	.12¾	....	.12½	....	.13	....	.13¾	.12½	500
Golden Fleece	"	1	.26	....	.24	....	.25	....	.27	....	.27	....	....	....	....
Gold & Globe	"	1	....	....	....	....	.03	....	....	....	....	....	....	....	....
Gold Magnet	"	1	.00¾	....	.00¾	....	.0¾	....	.00¾	....	.00¾	....	.001	.0¾	....
Gould & Curry	Nev.	3	....	....	.25	....	.25	.22	.25	.21	.25	....	....	....	....
Hale&Norcross	"	100	1.75	....	1.10	....	1 50	1.10	1 40	.90	1 50	.90	....	....	100
Homestake	S. Dak	100	50 00	....	....	....	50 00	....	50 00	....	50.00	....	....	....	....
Horn Silver	Utah.	25	1 15	1.10	1 5	....	1.10	....	1.15	....	1 15	....	....	....	....
Iron Silver	Colo.	20	.73	.70	.81	....	.78	.76	.74	....	.73	.70	....	....	250
Isabella	"	1	.06¾	....	.08	....	.26	....	.27	....	.28	.27	.30	.27	400
Japan	"	10	....	....	2.90	....	2.50	....	....	....	....	....	.08	.05	....
Jefferson	Colo.	1	.05	....	.04¾	....	.04	....	.05	....	.05	....	....	....	....
Julia Con	Nev	1	0.	....	.01	....	....	....	....	....	....	....	....	....	....
Justine	olo.	1	.01½	....	.0.¾	....	.0.¾	....	.01¾	....	.02	....	.04	.01¾	....
King & Pemb	Ont.	10	.15	.12	.15	.12	.14	.12	.1	.12	.12	....	....	....	....
Lacrosse	Colo.	10	.14	.08	.14	.08	.14	....	.12	.09	.09	....	....	....	300
Lagonda	"	1	.37½	....	....	....	....	....	....	....	....	....	....	....	....
Leadville Con.	"	10	.08	.07	.09	.07	.09	.07	.07	....	.09	.07	....	....	....
Lillie	"	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Little Chief	"	50	.2.	.07	.2.	.07	.2	.16	.16	....	....	....	....	....	....
Mexican	Nev.	3	.20	.17	.30	.17	.30	.17	.25	.20	.25	....	.26	.23½	400
Mollie Gibson	Colo	5	.26	....	.24	....	....	....	.21	....	.24	....	.21	.18¾	2,000
Mt. Rosa	"	1	.18¾	....	.18¾	.17	.33	....	.18	....	.17	....	....	....	....
Occidental	Nev.	3	.80	....	.80	....	.85	....	....	....	....	....	.07	.0.85	....
Old Gold	Colo.	1	.0055	....	.0055	....	.0037	....	.0036	....	.0033	....	....	....	....
Ontario	Utah.	100	5 00	....	5 00	....	5.00	....	5.50	....	5.50	....	....	....	500
Ophir	Nev.	3	.60	....	.60	....	.60	....	.50	....	.60	....	....	....	2,300
Pharmacist	Colo	1	.03	....	.05	....	.06	.05	.03	....	.03	....	....	....	2,000
Phoenix	Ariz.	1	....	....	.12	....	.10	.08	.12	.09	.12	.09	....	....	2,000
Pilgrim	Colo.	1	.002	....	.002	....	.002	....	.002	....	....	....	....	....	....
Plymouth Con.	Cal.	10	.07	....	.10	.07	.10	.07	.12	....	.07	....	....	....	....
Portland	Colo.	1	1 40	....	1 40	1.3	1 45	....	1.35	....	1 40	....	....	....	7.0
Potosi	Nev.	3	.20	....	.21	.20	.20	.15	.16	.15	.18	....	....	....	....
Quicksilver	Cal	100	1 50	....	1 45	....	1 25	....	3 00	2.50	....	....	....	....	900
do. pref	"	100	....	....	....	....	8.5	7.75	10.0	9 00	....	....	.03	.01¾	1,538
Rocky Mtn	Colo.	1	....	....	.01	....	.01¾	....	.01¾	....	.01	....	....	....	....
St. F. Cariboo	B.Col.	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Savage	Nev.	2½	.17	.15	.15	....	.20	....	.15	.12	.12	....	.0016	.0015	200
Sentinel	Colo.	1	....	....	.0015	....	.0017	....	.0017	.0016	.0011	....	.0016	.0015	61,000
Sierra Nevada	Nev.	3	1 30	....	1 10	....	1.00	....	.85	.80	.85	....	....	....	800
Small Hopes	Colo.	20	1 15	....	1 15	....	1 05	....	1.1	....	1 10	....	....	....	....
Standard Con.	Cal	100	1.85	1 75	1.90	....	1 90	....	1 90	....	1.75	....	....	....	600
Syndicate	"	100	....	....	340	....	3 0	....	350	....	345	....	345	....	....
Union	Colo.	1	.17	....	.18	....	.16	....	.17	....	.17	....	....	....	....
Union Con.	Nev.	2½	.20	....	.20	....	.20	....	.15	....	.15	....	....	....	....
Utah Con.	"	3	.10	....	.10	....	.10	....	.10	....	.10	....	....	....	....
Waldorf	Colo.	1	.01¾	....	.01	....	.01¾	.01¾	.01¾	....	....	....	.01¾	.01	800
Work	"	1	....	....	.11	.10	.11	.09	.10	....	.10	....	....	....	....
Yellow Jacket	Nev.	3	.33	....	....	....	....	....	.20	....	....	....	....	....	700

COAL AND INDUSTRIAL STOCKS.

American Coal	Md.	$25	140	120	150	140	150	120	150	120	150	120	....	....	....
Central of N. J	N. J	100	94	....	95½	94¾	96	94¾	96¾	95¾	95	94¾	....	....	....
Col. C. & I. Dev	Colo.	100	1¾	⅝	1¾	⅝	1¾	⅝	1¾	⅝	1¾	⅝	....	....	5,710
Col. Fuel & I.	"	100	24½	23¾	26½	24	26¾	25¾	26	25¾	25	....	....	....	5,952
Col. & H. C. & I	Ohio.	100	....	....	....	....	....	....	....	....	6¾	5¾	6¾	....	1,200
Con Coal	Md.	100	....	....	47	....	50	....	50	....	50	....	....	....	....
Del. & Hud	"	100	106¾	106¾	107¾	106	107	....	107¾	107	107	106¾	106¾	....	5,641
Ed'n E.Lof N.Y	N. Y	100	185	180	191	188	191	188¾	193¾	191	191	190	192	....	6,027
*Federal Steel	"	100	31¾	31¾	33¾	31¾	33¾	31¾	34¾	33¾	36¾	34¾	37¾	....	2,994
" " pf	"	100	78¾	77¾	94	89¾	79¾	77¾	79¾	78¾	8.¾	79	80	....	159,600
Marshall Mill	N. Y.	1	....	....	....	....	....	....	....	....	55	....	....	....	1,000
Maryland C. pf	Md.	100	55	52	56	52	55	52	55	52	55	52	....	....	....
Minnesota Ir.	Minn.	100	....	....	....	....	....	....	....	....	....	....	....	....	....
National Lead	"	100	37¾	37	37¾	37	37	36¾	37¾	36¾	37¾	37	37¾	....	26,349
New Central C	Md.	100	42	38	41	38	51	48	40	38	40	38	....	....	....
N. Y., Ont. & W.	N. Y.	100	16¾	16¾	17¾	16¾	17¾	16¾	18¾	16¾	17¾	17¾	17¾	....	66,592
Penns'lv'nia C.	Pa.	100	....	340	....	3 0	....	350	....	345	....	345	....	....	....
Phila. & Read	"	100	18¾	18¾	19	18¾	19	....	20¾	18¾	20	19¾	19¾	....	21,470
" " 1st pf.	"	100	47	45¾	47	46¾	47¾	46¾	48¾	46¾	48¾	48	47¾	....	56,110
Standard Oil	"	100	4.2	420¾	422¾	421¾	4.3	422¾	425	424	430	429	....	....	....
Tenn.C.,I.&R.R.	Ala.	100	32¾	31¾	33¾	32¾	34¾	33¾	34¾	32¾	34½	33¾	34	....	76,118

‡ Official quotations of New York Stock, Consolidated Stock and Petroleum and Mining Exchanges. Total sales. Mining, 64,800; other stocks, 691,789 shares. *When issued.

PHILADELPHIA, PA.‡

Name of Company	L'cation.	Par Val.	Dec. 9. H.	Dec. 9. L.	Dec. 10. H.	Dec. 10. L.	Dec. 12. H.	Dec. 12. L.	Dec. 13. H.	Dec. 13. L.	Dec 14. H.	Dec. 14. L.	Dec. 15. H.	Dec. 15. L.	Sales
Cambria Iron	Pa.	$50	42 85	42 38	42 50	42 00	42 75	42.38	42 88	42 50	42 75	42 63	42 75	42 63	4,745
Choctaw pref.	I. T.	50	42 7	42.00	42 2	....	43 00	42.38	43.0	42.50	43 13	42 50	42 7	....	5,638
Hunt & Br.Top	Pa.	50	....	....	1.00	....	11 50	....	12 00	....	....	....	....	....	50
Lehigh Nav.	"	50	....	....	....	....	....	....	38 0	37.00	38 0	....	....	....	3 9
" Val.	"	....	22 88	21 25	22 88	22 25	22 88	22.50	22.38	22 0	22 63	22.50	22 50	22 00	4,667
Penna. R. R.	"	....	59.75	59.5	59.75	....	60 00	59.75	60 25	60.0	61 00	60.00	61.0	60 63	9,734
Penna. Steel	Pa	100	21.0	....	....	....	23.5	....	23.00	....	20.00	....	....	....	179
" pr'f	"	100	....	....	....	....	....	....	....	....	....	....	....	....	....
United Gas I.	"	50	127¾	126¾	128	127¾	128	127¾	127¾	127	127	126¾	126¾	125¾	17,928
Welsb. of Can.	Can.	5	....	....	....	....	....	....	....	....	....	1.50	....	1.5.	300
Welsb. Coal	"	100	10 10	....	....	....	....	....	....	....	....	....	....	....	143
" pref	"	1 0	61 00	....	62 0	6.5	5)	....	....	....	....	....	62.00	....	507
" Light	"	100	38 63	37 75	39 00	38 25	39 5	38 00	38 88	38 00	39 50	38.50	40 50	39 0	4,740
West. Coal	Pa.	50	....	....	....	....	51 0	....	....	....	....	....	....	....	5

‡ Official quotations Philadelphia Stock Exchange. Total shares sold, 49,070.

PITTSBURG, PA. Dec 14.

Name of Company.	Location.	Par val	Bid.	Ask.	Name of Company.	Location.	Par val	Bid.	Ask.
Allegheny	Pa.	$100	....	....	N.Y. & C. Gas	Pa.	$50	....	....
Carborundum	"	100	....	....	Peoples' Natural Gas	"	50	....	....
Chartiers Valley	"	100	....	24	Peoples' Pipeage	"	25	....	....
Enterprise Mining	Colo.	5	....	....	Pennsylvania Gas	"	50	....	....
Lustre Mining	Mex.	10	8	10	Philadelphia Gas	"	5.	39¼	39¾
Mansfield Coal	Pa.	50	....	....	Silverton Mining	Colo.	10	....	....
Manufact. Gas	"	50	....	....	Wheeling Gas	W.V.	50	....	....

BOSTON, MASS.†

Name of Company.	Par val.	No. of shares	Dec. 9. H.	Dec. 9. L.	Dec. 10. H.	Dec. 10. L.	Dec. 12. H.	Dec. 12. L.	Dec. 13. H.	Dec. 13. L.	Dec. 14. H.	Dec. 14. L.	Dec. 15. H.	Dec. 15. L.	Sales
Aetna, cons	$5	100,000	4.00	....	....	....	....	....	....	....	....	....	....	....	10
Allouez, c	25	80,000	5 00	....	....	....	5.00	....	5 00	....	5.25	5 00	5 25	5.00	1,525
Arcadian	25	100,000	39 25	38.00	....	....	38 88	38 5	38 50	37 88	39.00	38.2	39 00	38 ..	3,698
Arnold, c	25	40,000	14.00	12 50	....	....	13.00	12 50	15 00	14.5.	5 00	14 0	14 50	13.50	14,340
Ash Bed, c	25	40,000	....	....	....	....	....	....	....	....	....	....	2 00	....	10
Atlantic, c	25	40,000	32 25	....	32.00	....	32.00	31 50	....	....	....	....	....	....	330
Baltic, c	25	100,000	28 25	27 75	27.00	....	29 88	26 .5	31 00	29 50	3 .75	29 25	29 88	29 00	14,335
Bonanza, g	10	300,000	1 35	1.27.	1 50	1 4	1 80	1 50	1 75	..	1.80	1 7.	1 80	....	8,650
Boston & C C. g	2	200,000	42½	....	.42¾	37½	.42	38	.38	....	4	87½	.4	.38	2,500
Bost.&Mont,gsc	25	150,000	....	....	237	236	239	237	2.4	234¾	.236	....	237	230	2,987
Breece, l	25	200,000	....	....	....	....	....	....	....	....	....	....	....	....	....
Butte & Bost., c	10	200,000	68.00	66 00	67.00	66 50	68 00	66 00	67 75	66 00	9 .75	66 00	68.00	66.50	14,922
Cal. & Hecla, c	25	100,000	615	610	6 5	....	....	....	615	....	15	....	615	....	135
Catalpa, s	10	300,000	.25	....	.25	....	26	....	....	....	30	38	30	....	3,735
Centennial, s	25	80,000	25.88	25 50	25 75	25 50	26 00	25 50	25 88	25.53	26 88	25 75	26 38	26 00	6,892
Crescent	10	150,000	.22	....	17	....	22	.21	.22	....	.22	....	.22	....	14,100
Dominion Coal	100	150,000	33.00	32.88	31.38	33 00	35 00	33.25	34 75	34 25	34 50	33.63	33 50	32 5.	12,437
do. pref	100	80,000	117	115¾	....	....	1 7	....	....	....	....	....	.18	....	179
Durkin Mg	10	200,000	.27¾	....	....	....	.25	....	....	....	....	....	....	....	800
Franklin, c	25	40,000	9 00	18 50	17 50	18.	0 17.63	18 00	17 75	18 25	18 00	18.50	17 88	4,265
Gold Coin	20	200,000	60	50	....	.50	60	.50	60	40	.60	40	....	....	995
Humboldt, c	25	40,000	4 0	3.75	....	....	3 63	3.50	3.50	....	4 00	3 50	....	....	....
Illinois Steel	100	186,500	....	....	....	....	....	....	....	....	....	....	....	....	....
L. Loyale Con.	25	100,000	29 75	29 25	29 50	....	29.25	28 50	28.50	....	28.50	....	28 50	....	825
Lake Sup	25	84, 00	....	....	....	....	....	....	....	....	....	....	26.00	....	100
Merced	15	100,000	5.38	5.24	....	....	....	....	....	....	5 00	....	....	....	200
Napa, q	7	100,000	....	....	....	....	....	....	....	....	7 75	....	....	....	....
New Idria, q	5	100,000	....	....	....	....	....	....	....	....	....	....	....	....	....
N. A. Gold Dre'g	10	100, 00	15.00	14.38	15 75	15.00	18.00	16 75	17.2	16.00	18 00	17.00	18.75	17.75	15,690
Old Dominion, c	25	150,000	34 00	33 00	34.0	33 25	34 00	33 50	34 0	33.50	33 75	33 0	33. 0	32. 0	4,394
Osceola, c	25	100,000	75.50	70.75	41. 0	70 25	1.50	75 .3	71 25	1.00	71.00	70 50	70 25	69 50	3,745
Parrot, s & c	10	200,000	....	....	....	....	29 00	....	....	....	30 00	....	30 00	....	400
Pioneer, g	10	100,000	5 3	5.00	5.25	5.10	5.25	5 10	5 63	5.25	6 00	5 63	5.88	5 75	6,211
Quincy, c	25	100,000	137	....	136	....	137	134	136	....	137	136	136	....	326
San. Ysabel, g	5	100,000	....	....	6 50	6.13	6.50	....	6 75	6 50	....	....	6 50	....	270
Tamarack, c	25	60,000	70	....	170	....	170¾	170	172	1.70	172	170¾	171	....	337
Tecumseh, c	25	40,000	5.75	5.25	5 63	....	5.50	....	5.50	....	5.50	5.00	5 50	5.25	1,811
Utah Con., g	10	100,000	....	....	....	....	....	....	....	....	....	....	....	....	....
Victor	25	200,000	5 00	....	5 38	5 00	....	....	....	....	....	....	5 75	....	400
Washington Mg	25	40,000	....	....	....	....	1.25	....	....	....	1 2.	....	....	....	300
Wolverine, c	25	60,000	32 00	....	32.00	31 75	32 2.	32.0	32 25	32 0	32 25	32 0	32 13	32 00	2,225

† Official quotations Boston Stock Exchange. Total shares sold, 149,849.

BALTIMORE, MD.‡ Dec. 15.

Name of Company.	Location.	Par value	Bid.	Ask	Name of Company.	Location.	Par value	Bid.	Ask
Atlantic Coal	Md..	$10	....	....	Howard C. & I	Md.	$5	..	..
Big Vein Coal	" ...	10	....	....	Newburg Orrel C.	" ..	25	..	..
Consolidation Coal	"	100	52	55	Silver Valley	N. ..	5	....	.....
George's Creek Coal	"	100	113¾	16	....	....	....	....	.....

CLEVELAND, O. Dec. 14.

Name of Co.	Iron Range	Par Val.	Dec 14. Bid.	Dec 14. Ask.	Name of Co.	Iron Range	Par Val.	Dec 14. Bid	Dec 14. Ask.
Aurora	Vogebic	$25	....	$1	Jackson	Marquette	$25	....	....
Champion	"	25	....	25	Lake Superior	"	25	$26	$30
Chandler	Vermillion	25	$40	4.	Minnesota	Verm. & Mes	00	91	92
Cleve'd-Cliffs	Marquette	100	47	50	Pitts & L'keAng	Marquette	25	105	125
Fed. Steel Co.	"	100	29¾	30	Republic	"	25	9.¾	10

ST. LOUIS, MO. Dec. 14.

Name of Company.	Location.	Par value.	Latest Bid.	Latest Ask.	Sales.	Name of Company.	Location.	Par value	Latest Bid.	Latest A k	Sales.
Am. Gold	Colo.	$10	....	....	.....	Granite B.	Mont.	$10	$ 50	$0.55	1,500
Am Nettie	Colo.	10	$0.99	....	....	Hope St.	Mon.	10	....	....	.....
Central L	Mo.	100	9 00	92.00	....	St. Jo e. L	Mo.	10	12.75	13.50	.....
Doe Run L	Mo.	100	130	....	.....	Sm. Hopes	Colo	20	....	....	.....

COLORADO SPRINGS, COLO.‡

Name of Company.	Par val	Dec. 5. B.	Dec. 5. A.	Dec. 6. B.	Dec. 6. A.	Dec 7. B.	Dec 7. A	Dec 8 B.	Dec 8 A.	Dec 9 B.	Dec 9 A	Dec. 10 B.	Dec. 10 A.	Sales.
Alamo	$1	04¾	.05	....	....	04¾	05	04¾	....	....	....	04¾	....	2800
Anaconda	1	60	....	39¾	61	81	.81½	5	....	57	....	....	....	2525
Ark'nsumJ	1	38	40	.38¾	38¾	38¾	3.¾	36	36¾	.37½	38 ..	.37¾	38	12,400
Banner	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Battle Mtn	2	41¾	42¾	.40	.41	39¾	.40	.39¾	.40	40¾	40¾	.40	.42	15,500
Bob Lee	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Columbine	1	15¾	.15¾	14¾	15.	14¾	.13¾	14	14¾	14¾	.14¾	14¾	.14¾	7,00
Cr. & C. C	1	....	....	....	....	....	.05¾	....	....	....	....	....	....	1,000
C. C. Con	1	....	....	....	08	.08¾	....	....	....	07¾	....	....	....	4,500
Currency	1	03¾	....	....	....	....	....	....	....	.03¾	03¾	....	....	12,000
Des Moines	1	....	....	....	01¾	01¾	....	....	....	....	....	....	....	5,400
ElktonCon	1	9 3¾	93¾	85	92	....	....	82	83	81	83	77½	.81	14,185
El Paso G.	1	12¾	12½	12	....	12	....	11¾	....	....	....	....	....	4,500
Fanny R.	1	.43	44	....	....	....	....	.40	.42	40	4.¾	....	....	8,500
Favorite	1	03¾	03¾	.03½	....	....	....	....	....	....	....	.03	....	15,000
Findley	1	16¾	.16¾	15¾	.16	.15¾	....	15½	15¾	15½	....	.15¾	.15¾	44,500
Franklin	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Gold & Gl.	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Golden Fl.	1	3.	....	....	....	....	....	....	....	....	....	....	....	100
Hayden G.	1	....	....	....	....	....	....	05¾	....	006	008¾	....	....	12,000
Independ'e	1	.51½	....	.57	.58	.57¾	.58¾	57	58	57¾	.58	58¾	.58¾	5,700
Ing. Con	1	08	.08¾	07¾	.08	....	....	0.	....	....	....	....	....	17,500
Isabella	1	.26¾	26¾	26	26¾	.26¾	26¾	25	25¾	26	26¾	26¾	....	6,000
Jack Pot	1	24¾	25	.24¾	25¾	24¾	....	24¾	24¾	.24¾	25	25	25¾	24,250
Lillie	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Ma'net R.	1	....	....	....	....	0 3¾	....	....	....	....	....	....	.03¾	2,000
Marion	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Matoa	1	33	....	32¾	34	.32	.32¾	31	.31¾	31	31¾	....	....	33,000
Mobile	1	03¾	....	.03¾	....	....	.03¾	03¾	.03¾	....	....	....	.03	15,000
Moll e Gib.	1	....	....	....	.25	....	.25	.25	....	.25	....	....	....	3,000
Moon-A'c'r	1	....	....	....	....	1 18	1.17	....	....	1.16¾	1 18	1 18	1 25	2,902
Mt. Rosa	1	....	....	....	....	....	....	....	....	....	....	....	....	....
New Haven	1	.02¼	....	....	....	.02	....	....	....	....	....	01¾	.02	3,000
Oriole	1	....	....	.001¼	01¾	....	.01¾	....	....	....	....	01¾	....	8,000
Pharmacist	1	.03¾	....	.03¾	03¾	....	.03¾	.03¾	....	.03¾	....	04	....	12,500
Pilgrim C.	1	....	....	03	....	....	....	....	....	....	....	....	....	500
Pinnacle	1	04	04¾	.03¾	.04	.03¾	03¾	....	....	....	....	....	....	28,000
Portland	1	1.42	1 43¾	....	....	1 46¾	1 48	1 47	....	1.47	1.47¾	1.44	1 45	36,600
Prince Alb.	1	....	....	....	....	....	....	....	....	....	....	....	02	1,000
Princess	1	....	....	....

STOCK QUOTATIONS.

DENVER, COLO.‡

Name of Company.	Par val.	Dec. 5 B	Dec. 5 A	Dec. 6. B	Dec. 6. A	Dec 7 B	Dec 7 A	Dec. 8 B.	Dec. 8 A.	Dec. 9 B.	Dec. 9 A.	Dec. 10. B.	Dec. 10. A	Sales.
Mines.														
Anac'da G.	$5	59⅝	.60	.59⅝	.60	..	.61	.58	.60	...	.61	.55	.60	3,400
Arg. J.	1	40	41	37½	39¼	..	..	.35	36	.36	.38	.....	.....	12,500
Bankers	1	.05¾	.06	.05¾	.06	.05¾	.06	.05½	.05¾	.05¾	.05¾	.05¾	.....	2,000
Big Six	1	.07	..	.06	..	.04	.....	.05	.....	.04	.....	.....	.....	5,000
C. C. Con.	1	.08½	.08¾	.08¾	.08½	.08¾	.08¾	.07¾	.....	.07¾	.08¼	.....	.....	7,000
Elkton Con.	1	92	93	89	.89	84	.85½	.85	.....	.81	.....	79	79¼	3,000
El Paso, etc.	1	.....	.....	12	12½	.....	.....	11	.....	...	.....	.....	.....	13,000
Enterprise	1	.04¾	.06	.04	.04	.....	.....	.03¾	.....	.03	.....	.....	.....	6,000
Fanny B.	1	.41	.46	...	.43½	.40	.43	.39	.44	...	.....	.....	.....	2,000
Garf. C. Co.	1	.12½	.....	.12½	.....	.12½	.13	.13½	.....	.12	.....	.12½	.....	1,000
Gold & Sil.	1	.05	.....	.05	.06	.05½	.....	.....	.....	.....	.....	.....	.....	2,000
Gold Coin.	1	1.46	1.48	1.51¾	.....	1.50	1.55	1.55	.....	1.52	.....	1.58	.....	1,800
Independ'nce	1	.6 ½	.61	.60	.....	.58½	.5.½	.58½	.58½	.58	.59	.58	.59	4,600
Iron Clad.	1	.03½	.03½	.02½	.03	.02½	.04	.02½	.02¾	.02½	.02¾	.2½	.02¾	3,000
Isabella.	1	.26	.26	.26	.26¾	.26¼	.26¾	.25¾	.25¾	.25½	.26½	.26½	.27	40,000
Jack Pot.	1	.24¼	.24½	.24½	.25	.24	.24½	.24¾	.24¾	.24½	.25	.25¼	.25¾	6,000
Key Stone.	1	.05¾	.05½	...	.....	.05	.0 ½	.05	.05½	.04¾	.05½	.4¾	.05½	5,000
Maton	1	.32	.33	.33	.34	.32	.32¾	.29½	.3?	.3?	.3	.3 ½	.31 ½	9,5
Mollie Gib.	5	.16½	.....	.5	.29	.25	.26	.23	.25	.23	.25	.23¾	.24½	5,000
Moon A.	1	1.19	1.20	1 0	1.28	1.16	1 .8¾	1.15¾	1.1.	1.15	.....	1.15	1.	1,100
Mt Rosa.	1	.21	.21½	.19	.19¾	.18½	.19½	.8	.19½	19	19¼	19¼	19½	6,0
NewZ aland	1	.11	.13	.11	.11	.11	.13	.1.¾	.12½	.12	.....	.12	.14	3,000
Pharma. ist	1	.03¾	.04	.04	.04½	.03¾	.04½	.03¾	.....	.03¾	.04	.03¾	.04	10,000
Portland.	1	1.42	1.42¾	1.46	.48	1.46	1.45¾	1.46¾	.....	1.46	1.47½	1.43	..	5,000
Pr. albert.	1	.01¾	.02¾	...	.01¾	.....	.01¾	.02¾	0 ¾	.....	.....	.01¾	.....	5,000
Sacram'nto	1	.03¾	.04¾	.04½	.....	.....	.....	.03¾	.04¾	.03¾	.04¾	.03¾	.04¾	6,0 0
Specimen	1	.04	.04¾	...	.....	.....	.....	.03¾	.04¾	.04	.04¾	.....	.....	3,00
Squ wMin	1	.009	.01¾	.01	.....	.009¾	.....	.17	.....	.....	.1¾	.01	.01¾	10,0 0
Union Gold	1	.19¾	.2	.19	.20	.....	.....	.....	.18¾	.19	.18½	.18¾	15,50	
Work	1	.13¼	.13¾	..	.12¾	.11	.11¾	.11¾	.11¾	.11¾	.11¾	.12	1,000	
Prosp'cts:														
Ben Hur		.03¾	.04¾	.03½	.04½	.03¾	.04¾	.03¾	.....	.03¾	.04¼	.04	.....	4,0 0
C. C. Imp.	1	.01¾	.02¾	0 1¾	.02¾	0 1¾	.....	0 1 ..	.....	.01¾	.02	.01¾	.02¾	2,000
Finoley	1	.16½	.17	.16¾	.....	.15	.15¾	.15¾	.15¾	.5	.15¾	.4¾	.15¾	,000
Gentle Field.	1	.01¾	.02	0 1¾	.....	0 1¾	.02¾	0 1¾	.02¾	.01	.....	0 1¾	.02¾	2, 0
Geo. Wash.	1	.02	.03	.02¾	.....	.....	.....	.02	.....	.02	.04	.0 2	.....	1,000
Gilpin Four	1	.0 4	.05	.04	.005	.004	.01¾	0 1	.....	.04	0.5	.04¾	.005	32,00
New Haven	1	.02¾	.03¾	.02	.....	.02	.02¾	.02	.02¾	.01¾	.02¾	.01¾	.02¾	15,0 0
Pilgrim.	1	.05	.....	.03	.003¾	.....	.003	.001	.003¾	.00 ¾	0 3¾	.02¾	.003	.....
Pine Creek.	1	.03¾	.04	.03¾	.....	.03	.04	.03	.....	.03¾	.05	.03¾	.....	2,000
Puritan.	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Reno.	1	.01¾	.03¼	.02¾	.....	.02¾	.03¾	.02	.....	.02	.02¾	.02	.02¾	.....
Tamarack.	1	.005	.006	...	.....	.005¾	.0.6	.001	.....	.05¾	.06	.0.6	0 6¾	15,000

‡Official Quotations Denver Stock Exchange. Sales, Mines, 178,500 shares; Prospects, 74,000 shares; grand total, 252,500 shares.

SALT LAKE CITY, UTAH.*

Dec. 10

Stocks.†	No. of shares	Par val.	Bid.	Asked.	Stocks.†	No of shares	Par val.	Bid.	Asked
Ajax	300,000	$10	$0.58	...	Homestake	400,000	$1	$0 04¾	$0.04¾
Alice	400,000	25	.75	$1.25	Horn Silver	400,000	25	1 15	1 30
Anchor	150,000	10	.75	1.50	Little Pittsburg	400,000	5	11¾	12
‡Brick Con	500,000	1	.....	.....	Lower Mammoth	150,000	1	73¾	.74
Buckeye	500 000	1	.06¾	.06¾	Mammoth	400,000	5	2 10	2.12½
Bullion-Beck & Ch.	100,000	10	4 50	5.50	Mercur	200.000	25	7 80	8.00
Centennial Eureka	30,000	50	35 00	40 00	Northern Light	400,000	5	42½	43
Chloride Point	500,000	1	1.15	1.17½	Omaha	300.000	2	.55	57
Daisy	500,000	3	63½	.72	Ontario	150,000	100	6.60	7.00
Dalton	500,000	5	0 1¾	.02	Richmond-Am.	500,000	1	05	06
Dalton & Lark	2,500,000	1	07¾	.14	Sacramento	1,000,000	5	55½	58
Daly	150,000	20	1.04	1.25	Silver King	150,000	20	30 00	35 00
Daly West	75,000	20	4.12½	5 00	Star Consolidat'd	500,000	10	1.36½	1.37½
Dexter	200,000	5	3.15	3 17½	Sunbeam	250,000	1	.10	.10½
Eagle	150,000	1	.06½	.09	Sunshine	250,000	10	52	55
Emerald	300,000	1	16	17	Swansea	100,0 0	5	3 65	3 80
Four Aces	250,000	1	41¼	42	South Swansea	150,00	1	1 27½	1 28½
Galena	100,000	10	.58	59¾	Utah	100,000	10	.95	1 03
Geyser-Marion	300,000	5	.85	87	Valeo	200.000	1	1.35	1 40
Grand Central	250,000	1	7.10	9 50	Vanderbilt	200,000	1	50	.55

*From Our Special Correspondent. † Utah companies. ‡ Mines in Vanderbilt, Cal. Mines in Tuscarora, Nev.

SAN FRANCISCO, CAL.†

Name of Company.	Location.	Par. value.	Dec. 9.	Dec. 10.	Dec. 12.	Dec. 13.	Dec. 14	Dec 15.
Alpha Con.	Nev.	1.00	.....	.05	04	.03	03	.03
Alta	"	2.00	.....	.....	.....	.....	.....	.....
Andes	"	3 00	.....	07	.07	06	.06	.5
Belcher	"	3 00	.....	2	.18	15	16	.17
Best & Belcher	"	3 00	.....	.41	43	35	37	37
Bullion	"	1 00	.....	.04	.05	02	.....	.03
Caledonia	"	3 00	.....	.21	.20	.18	.17	.22
Challenge Con.	"	3 00	.....	.19	15	14	14	.14
Chollar	"	3 00	.....	.24	26	.19	19	19
Confidence	"	3 00	.....	.65	.....	.....	55	.56
Con. California & Virginia	"	2 50	.....	1 30	1.15	1 10	1 05	1 15
Cons. Imperial	"	1 00	.....	.01	.01	.....	.....	.....
Cons. New York	"	1 00	.....	.....	.....	.....	.....	.....
Crown Point	"	3 00	.....	.17	.14	.14	14	.15
Exchequer	"	1.00	.....	.....	.....	.....	.....	.....
Gould & Curry	"	3 00	.....	28	.26	26	25	.26
Hale & Norcross	"	1 00	.....	1 66	1 63	1.62	1 61	1 63
Julia Con	"	1 00	.....	.....	.....	.....	.....	.....
Justice	"	2.00	.....	19	17	.16	.16	.19
Kentuck Con	"	1.00	.....	06	06	.08	.08	.8
Mexican	"	3.00	.....	31	3?	28	.29	.....
Occidental Con.	"	3.00	.....	.92	.93	1.00	1.05	1 10
Ophir	"	3.00	.....	.62	.56	.56	.56	.57
Overman	"	2 00	.....	03	.06	.07	.08	.07
Potosi	"	3 00	.....	24	.22	19	17	.19
Savage	"	2 50	.....	15	13	.13	.13	.14
Scorpion	"	1.00	.....	.03	.03	03	03	.....
Sierra Nevada	"	3 00	.....	1 05	.89	.86	90	95
Silver Hill	"	1.00	.....	.....	.....	.....	.....	.....
Standard	Cal.	10)	.....	1.75	1.75	1.85	1.85	.....
Union Con.	Nev.	2.50	.....	.12	.10	.17	.18	.19
Utah Con	"	1 00	.....	.....	.....	11	11	.12
Yellow Jacket		3.00	.....	.17	.15	.15	.15	.16

Official telegraphic quotations, San Francisco Stock Exchange.

HELENA, MONT.*

Dec. 2.

Name of Company.	Location.	Company's office	Par value.	Bid.	Asked.	Shares sold.	Price.
Am. Dev. & M.	Idaho & Mont.	St. Paul, Minn. &Gib'ville,Id.	$5	.....	$1.00	.....	.....
Bald Butte	L. & Cl'ke Co.	Helena, Mont.	1	$2 00	2 50	550	$2.00
Bi-Metallic	Granite "	St. Louis, Mo.	5	.....	.....	.....	.....
Con.T.&P'rm'n	Cœur d'Alene,Id	Burke, Id.	5	.50	.60	1,000	.45
Gold Mountain	Ruby, Mont.	.....	.....	1.15	1.25	15,000	.....
Helena & Frisco	Cœur d'Alene	London.	5	7.00	7.50	100	8 00
Iron Mountain.	Missoula, Mont	Helena, Mont.	5	.....	.....	.....	.....
Judge	Meagher Co.‡‡	" "	.....	.08	.10	116,000	.....
Merrill (Gold)	Jefferson " "	Butte "	1	.....	.....	.....	.....
Ontario	DeerLodge" "	Helena "	1	.....	.....	.....	.....
Yellowstone	Meagher " "	" "	5	.05	.07¾	7,500	.05 to .07

* Special Report of Samuel K. Davis. Total shares sold, 2,600.

TORONTO, CAN.

Name of Company.	Par val.	Dec 8. B.	Dec 8. A.	Dec. 9 B.	Dec. 9 A.	Dec. 10 B.	Dec. 10 A.	Dec. 12. B.	Dec. 12. A.	Dec. 13. B.	Dec. 13. A.	Dec. 14 B.	Dec. 14 A.	Sales
Ontario														
Ham Reef	$1	.....	.9	.....	.19	.....	19¾	.....	20	.....	.18	.....	16	.....
Sup G & C.	.	.06¾	.07¾	.06¾	0 1¾	.06¾	.07¾	.07	.08	06¾	.08	.07	.08	3,000
British Col.:														
Athabaska	1	40	.50	41¾	.45	40¾	43	40	43	41	43	.41	42	2,700
B g Toree	1	13¾	16¾	14¾	.17	.15	17	.14¾	16¾	.15	.16¾	15	16	1,007
C'rib'o,M'K.	1	1.15	1 21	1 17	1 22	1 21	1.25	1.16¾	1 20	1 24	1 28	1.19	1 22	300
Command'r	1	.....	.12¾	.....	.12¾	.....	.12¾	.....	.12¾	.....	.12¾	.....	.12¾	
Dardenelles	1	.08	.11	09	12	10	.12¾	.08¾	.11	.09	11	.09	.11	1,000
Deer Park	1	.18¾	21	.19¾	22	.19¾	.13¾	19¾	21	19	20	19	19¾	15,200
Dundee	1	.....	.31	.....	35	30	.36	.....	36	.30	.35	.....	35	3,500
Even'g Star	1	.04	.06	.04	.06	04	.06	.....	04	.04	06	04	.06	.....
Gold Cache	1	.05	.06¾	.05	.08	05	.08	.....	08	.04	.06	05	.06	.....
Grand Prize	1	.....	.04	.....	04	.....	.....	.....	04	.....	.....	.....	04	.....
Iron Mask	1	.....	72	.....	.74	75	.83	.73¾	79	.79	86	.80	83	.....
Keystone	1	.....	11	.....	.11	.....	.11	.....	.1	.....	.....	.....	.....	500
Minnehaha	1	.18	.20	.18¾	22	18	22	18¾	22	.18	.22	.....	.....	17,000
Noble Five	1	...	18	15	.18¾	15¾	16	.....	18¾	15¾	16	.15	16	4,500
N'rt'n Belle	1	.....	.03¾	.....	03¾	.....	03¾	.....	03¾	.....	.03¾	.....	03¾	
Novelty	1	.03¾	.05	.....	04	.03¾	.04	03¾	04¾	.03	05	.5	05¾	4,500
Silver Bell	1	.....	.05	.....	05	.....	.05	.....	.05	.....	.5	.....	05¾	6,500
Smuggler,g.	1	.....	18¾	.....	19¾	17¾	18¾	17	.18¾	17¾	17¾	.17	17¾	17,250
Van Anda	1	.04	.06	04¾	06	04¾	06	03¾	05	04¾	.05¾	04	05	7,000
Victory Tri	1	.....	10	06	09	06	09	06	.09	.....	11	.....	09	1,5 0
Virginia	1	...	50	.....	55	...	45	37	41	.....	45	.....	42	500
War Eagle	1	2.95	2.90	2 90	2.95	2.90	2 94	2,90	2 94	2 89	2.95	2 93	2,91	25
White Bear.	1	.06¾	.07½	06¾	.07¾	.06¾	07	06¾	.07½	.06	06¾	06	07	7,400
Winchester	¼	...	.5	.....	.12	.....	15	09	.12	.....	.....	.....	.....	1,700
Develop Co:														
R.C Gold F.	1	04¾	.06	04¾	06	.04¾	06	.01¾	.06	.04¾	.06	.04¾	.06	500
Can. G. F S	1	.05	.07	.05½	.08	.05	.07	.00¾	.07	05½	07	.06	07¾	4,000

Total sales, 91,275 shares.

ROSSLAND, BRITISH COLUMBIA.*

Dec. 7.

Name of Company.	No. of shares.	Par value	Selling price.	Name of Company.	No. of shares.	Par value	Selling price.
Brandon & Gold. Cr.	1,50,000	$1	$0 25	Lerwick	500,000	$1	.....
Brit. Amer. Corp'n't'n	7,500,000	5	4 25	Lily May	1,000,000	1	$0.15
Brit Col. Corpor tion	1,500,000	2½	.....	Lon.&Van.Fin.Dev.Co	500,000	5	.....
Canadian Gold Fields	10,000,000	0 10	10	London B. C. Gold F.	250,000	5	.....
Cariboo	1,500,000	1	1 10	Monte Cristo	1,000.000	1	.....
Commander	5 0,000	1	.....	New Gold Fields, B.C.	250,000	1	4.00
Deer Park	1,000,000	1	.18	Novelty	1,000,000	1	05
Dundee	1,000,000	1	33	Queen Bess Prop.	120,000	5	.....
Evening Star	1,000,000	1	.....	Rambler Cariboo	1,000,000	1	.8
Fern	200,0.0	¼	.85	Reco	1,200,000	1	1.80
Gold Fields of B.C	3,000,000	3½	.....	Red Mt.View	1,000,000	1	.....
Hall Mines	250,0 0	5	4 00	St. Elmo	1,000,000	1	.....
Hattie Brown	1,000,000	1	.....	St. Paul	1,000 000	1	.....
Homestake	1,000,0 0	1	.06	Sarah Lee	1,000,000	1	.25
Iron Colt	1,0 0 000	1	.....	Silver Queen	1,500,000	1	18
Iron Horse	1,000,000	1	.....	Slocan Star	500,000	1	2 00
Iron Mask	500,000	1	.75	Vic Tr. MinesDev. Co.	25,000	5	.....
Josie	700,000	1	....	Virginia	500,000	1	.....
Jumbo	500,000	1	.20	War Eagle Con	2,000,000	1	2 95
Kenneth	1,000,000	1	25	Waverly Mines	100 000	5	.....
Keystone	1,500,000	1	25	White Bear	2,000,000	1	.10
KootenayGold Fields	20,000	...	.....	Wild Horse	400 000	1	.....

* From Our Special Correspondent.

MEXICO.

Dec. 8.

Name of Company.	No. of shares.	Last div'd.	Prices. Op'g	Prices. Cl'g.	Name of Company.	No. of shares	Last div'd	Prices Op'g	Prices Cl'g
Chihuahua:					Hidalgo:				
Gloria	1,500	.....	$60	$50	Real del Monte	2,354	10 00	800	770
Durango:					San Francisco	6,000	2.00	28	270
Barradon y Cab	2,400	.....	150	150	San Rafael y An	1,200	10 00	1,000	980
Candelaria de Pan.	1,200	.....	20	20	do aviado	1,200	10 00	500	460
Capuzaya	2,400	.....	10	50	do. del Oro	3,000	.....	20	15
Penoles	2,500	30.00	2,000	2,000	Soledad	960	5 00	4 0	380
Restauradora	10,000	.....	20	30	Sorpresa	960	5 00	350	300
Rosario y Anexas.	4,800	.....	30	20	Union	2,000	4 00	300	350
Guanajuato:					Mexico:				
Angustias	2,400	10.00	310	315	Coronas	500	.....	75	75
Cinco Senores y An	2,000	15.00	450	450	Esperanza y An.	3,000	10 00	1,350	1,400
El Oro	500	.....	30	30	Michoacan				
do. pref.	2,000	.....	30	30	Luz de Borda ava	3,000	.....	18	20
Guadalupe	10,000	2.00	220	240	do aviado	1,000	.....	20	15
Trinidad, aviador	2,000	...	125	110	Pueblo:				
do. aviado	400	...	110	10	Tlauxingo	2,400	.....	40	27
Zona Minera de Paz	2,400	...	90	95	S. Luis Potosi:				
Hidalgo:					Concep. y An.	3,000	.....	150	155
Amistad y Concord.	9,600	1.38	25	28	Sta.MariadelaPaz	2,400	10 00	700	715
Arevalo	720	.....	200	200	Zacatecas:				
Bartolome de Med.	2,000	3.00	80	80	Asturiana y An	2,500	10.0	90	110
Carmen	1,100	7.75	500	520	Cabezon	2,400	.....	20	15
Luz de Maravillas.	1,100	...	150	160	C'delar. de Pinos.	2,500	.....	160	150
Pabellon	1,000	27.89	40	20	Palma de Somb.	2 4 00	.....	100	100

NOTE.—In most of the older Mexican mining companies the shares have no fixed par value. The capital is formed of a certain number of shares, the total value not being named. Many newer companies have a nominal par value, usually $50 or $100. Prices are in Mexican dollars.

SHANGHAI, CHINA.‡

Oct. 24.

Name of Company.	Country.	No. of shares.	Value. Par.	Value. Paid up.	Last dividend. Date.	Last dividend. Amount.	Price.
Jelebu Mg. & Trad.	China	45,000	$5	$5	Oct,. 1894.	$0.25	Taels 3.28
Punjom Mg., Ltd.	"	6 ,0 0	8	5	.....	.....	" 4 38
do. pref	"	30,000	1	1	.....	.....	" 1.17
Kaah A'lian G. Mg	"	200,000	$1	14s. 10d	July, 1898	.51	" 26.28
Sheridan Con. M.& M.	Colorado, U.S	20,000	Taels 100	Taels 100	.....	.....	" 2.25

‡ Special Report of J. P. Bisset & Co. The prices quoted are in Shanghai taels

VALPARAISO, CHILE.‡

Nov. 5.

Name of Company.	Location.	Capital paid.	Sh. Val paid up.	Last Div'n d. Amt.	Last Div'n d. Date.	Prices. Bid.	Prices. Asked.	Prices. Last sa e
Arturo Prat, silver	Chile	$3,300,000	$100	4 p. c.	1897	16½	17	16½
Caracoles, silver	"	315,000	100	10 "	1894	.....	.....	.....
Huantajaya (mine) silver	"	1,000,000	100	13 "	1894	.....	.....	.....
Huanchaca, silver	Bolivia,	8,000,000	25	8 "	1895	30	32	35
Oruro, silver	Chile	800,000	200	.....	.....	260	270	260
Todos Santos, silver	"	2,000,000	100	1 "	1895	6	10	5
Agua Santa nitrate	"	3,000,000	50	2 "	1894	150	155	155
Antofagasta, nitrate	"	2,000,000	200	3 "	1898	130	135	130
Soc. Internacional, nitrate	"	1,800,000	60	.....	.....	.....	.....	.....
Union, nitrate	"	3,000,000	200	.....	.....	65	68	65

‡ Special Report of Jackson Bros. Values are in Chilean pesos or dollars.

STOCK QUOTATIONS.

LONDON.

Dec. 2.

NAME OF COMPANY.	Country.	Authorized capital.	Par value.	Last dividend. Amt.	Last dividend. Date.	Quotations. Buyers	Quotations. Sellers
			£ s. d.	s.d.		£ s. d.	£ s. d.
Alaska-Mexican, g	Alaska	£200,000	1 0 0	0 4.8	Nov., 1898	1 2 6	1 7 6
Alaska-Treadwell, g	"	1,000,000	5 0 0	1 6	"	4 7 6	4 12 6
Anaconda, c., s	Montana	6,000,000	5 0 0	5 1¾	Nov., "	5 10 0	5 12 6
Cariboo, g f, pref	British Col'mbia	160,000	1 0 0			15 0	1 0 0
Chiapas, g., s., c	Mexico	252,500	1 0 0			5 0	7 0
Con. Gold Fields	"	300,000	1 0 0			15 0	1 0 0
De Lamar, g., s	Idaho	400,000	1 0 0	6	May, 1898	4 6	5 6
Doric, g	Colorado	125,000	5 0			3	9
Elkhorn Priority (New), s	Colorado	87,500	1 0 0	1 0	June, 1898	1 3	3 9
Golden Gate, g	California	80,000	1 0 0			2 6	5 0
Grand Central, g., s	Mexico	300,000	1 0 0	2 0	Dec., 1898	1 13 9	1 16 3
Hall Mines, c., s	British Col	250,000	1 0 0	1 0	May, 1898	7 3	10 0
Lillooet, F. R. & Car., g	" "	300,000	1 0 0			5 0	10 0
Montana, g., s	Montana	660,000	1 0 0	0 3	May, 1898	7 9	8 9
Mountain Copper	California	1,250,000	5 0 0	2 6	Sept., 1898	4 17 6	5 2 6
Plumas-Eureka, g	"	281,250	2 0 0	0 6	Oct., 1898	2 6	3 0
Richmond, g., s., l	Nevada	270,000	5 0 0	1 0	Dec., "	6 3	8 9
Sierra Buttes, g	California	245,000	4 0 0	0 6	Apr., "	1 6	2 6
Colomb. Hydraulic, g	Colombia	75,000	1 0 0	6	Oct., 1898	13 9	16 3
Copiapo, c	Chile	200,000	2 0 0	2 0	June, 1898	2 11 3	2 13 9
Frontino & Bolivia, g	Colombia	140,000	1 0 0	1 6	Oct., 1898	2 3 9	2 6 3
*St. John del Rey, g	Brazil	600,000	5 0 0	1 0	July, 1898	1 6 6	1 7 6
Tolima A., s., g	Colombia	70,000	5 0 0	5 0	July, 1897	1 5 0	1 7 6
Tolima B., s., g	"	30,000	5 0 0	5 0	" "	15 0	1 5 0
Utah Con., g	Utah	300,00	1 0 0	rts.	Mar., 1898	4 2 6	4 7 6
Linares, l	Spain	45,00	5 0 0	12 6	Sept., 1898	8 5 0	8 15 0
Mason & Barry, c., sul	Portugal	630,000	5 0 0	4 0	Oct., 1898	3 2 6	3 7 6
Rio Tinto, c	Spain	1,625,000	5 0 0	£1	Nov., 1898	24 15 0	25 0 0
" " pref	"	1,625,000	5 0 0	2 6	May, 1898	5 18 9	6 1 3
Tharsis, c	"	1,350,000	2 0 0	10 6	" 1898	7 7 6	7 12 6
Assoc. Gold Mines	W. Australia	5 0,000	1 0 0	2 0	July, 1898	5 11 3	5 13 9
Broken Hill Prop., s	N.S. Wales	384,000	8 0	1 6	Oct., 1898	2 2 6	2 5 0
*Great Boulder, Prop	W. Australia	1,750,000	2 0	6	Nov., 1898	1 0 9	1 1 3
Hannan's Brownhill, g	"	110,000	1 0 0	7 6	Nov., 1898	7 10 0	7 11 6
Harquahala	"	300,000	1 0 0	6 6	Nov., 1894	3	9
Ivanhoe Gold Corp	"	1,400,000	1 0 0			6 8 9	6 11 3
Kalgurlie, g	"	120,000	1 0 0			6 10 6	6 12 6
Lake View Consols, g	"	250,000	1 0 0	16 0	Apr., 1898	9 10 0	9 12 6
Mt. Lyell M. & R., l., c	Tasmania	900,000	3 0 0	2 6	Jan., 1898	6 12 6	6 17 6
Mt Morgan, g	Queensland	1,000,000	1 0 0	7	Nov., 1898	5 3 9	5 6 3
Waihi g	New Zealand	320,000	1 0 0	2 0	Dec., 1898	4 8 9	4 11 3
West Aust. Jt. Stk. Lin. & F	W. Australia	1,140,0	1 60 0	1 0	"	9 0	10 0
Champion Reef, g	Colar Fields	220,000	1 10 0	3 6	Sept., 1898	4 13 9	4 16 3
Coromandel, g	"	140,000	1 0 0	1 0	Aug., 1898	2 2 6	2 5 0
Mysore Gold, g	"	250,000	1 10 0	5 0	Nov., 1898	5 5 0	5 2 6
*Nundydroog, g	"	242,000	0 0	3 4	" 1898	3 13 9	3 16 3
Ooregam, g	"	145,000	1 0 0	1 0	Dec., 1898	3 7 6	3 10 0
" pref. g	"	120,000	1 0 0	1 0	" 1898	3 17 6	4 0 0
Angelo, g	Transvaal	275,000	1 0 0	5 0	Apr., 1898	6 5 0	6 7 6
*Bonanza, g	"	200,000	1 0 0	10 0	June, 1898	4 15 0	4 17 6
British S. Af., chartered	So. Africa	3,750,000	1 0 0	rts.	Apr., 1898	2 18 9	3 1 3
Cape Copper, c	"	600,000	1 0 0	7 0	Jan., 1899	4 15 0	5 0 0
" pref	"	150,000	2 0 0	7 0	" 1899	4 15 0	5 0 0
City & Suburban (New), g	Transvaal	1,360,000	2 0 0	8 0	Aug., 1898	5 7 6	5 10 0
Con Deep Level, g	"	260,000	4 0 0	xb.	Apr., 1898	2 17 6	3 2 6
Crown Reef, g	"	120,000	1 0 0	18 0	Nov., 1898	14 0 0	14 5 0
De Beers Con., d	Cape Colony	3,950,000	1 0 0	£1	June, 1898	26 3 9	26 6 3
Durban Roodepoort, g	Transvaal	135,000	5 0 0	4 0	Sept. 1898	5 12 6	5 17 6
Ferreira, g	"	90,000	1 0 0	30 0	Aug., 1898	24 10 0	25 0 0
Geldenhuis Deep, g	"	350,000	1 0 0	6 0	" 1898	9 15 0	10 0 0
Geldenhuis Est., g	"	200,000	1 0 0	12 0	Nov., 1898	7 15 0	7 17 6
Ginsberg, g	"	160,000	1 0 0	4 0	Aug., 1898	3 1 3	3 3 9
Henry Nourse, g	"	125,000	1 0 0	15 0	" 1898	9 17 6	9 12 6
Heriot (New), g	"	115,000	1 0 0	5 0	Nov., 1898	7 0 0	7 5 0
Jagersfontein, d	Orange Fr. St.	1,000,000	1 0 0	6 0	Sept., 1898	9 8 9	9 1 3
Johannesburg Con. Invst	So. Africa	2,750,000	1 0 0	2 0	Aug., 1897	1 2 6	1 5 0
§*Jubilee, g	Transvaal	50,000	1 0 0	5 0	Nov., 1898	11 10 0	11 0
Jumpers, g	"	100,000	1 0 0	6 0	Aug., 1898	5 0 0	5 2 6
Kleinfontein, g	"	275,000	1 0 0	rts.	Apr., 1898	2 12 6	2 15 0
Langlaagte Estate, g	"	500,000	1 0 0	3 0	Sept., 1898	3 0 0	3 2 6
May Con. (New), g	"	275,000	1 0 0	2 0	Jan., 1898	3 5 0	3 7 6
Meyer & Charlton, g	"	85,000	1 0 0	5 0	Aug., 1898	4 15 0	4 17 6
Namaqua, c	Cape Colony	200,000	1 0 0	3 6	July, 1898	3 2 6	3 5 0
Primrose (New), g	Transvaal	300,000	2 0 0	5 0	Aug., 1898	4 5 0	4 7 6
Rand Mines, g	So. Africa	400,000	2 0 0			32 15 0	31 0 0
Robinson, g	Transvaal	2,750,000	1 0 0	7 0	Aug ,1898	8 2 6	8 17 6
Sheba, g	"	1,100,000	1 0 0	0 6	July, 1898	1 7 6	1 10 0
Sim. & Jack Prop., g	"	5,000,000	5 0 0	3 6	Dec., 1898	5 1 3	5 3 9
Sim. & Jack West, g	"	400,000	1 0 0			3 2 6	3 5 0
Sim. & Jack East, g	"	70,0 0	1 0 0			2 16 3	2 18 9
Wemmer, g	"	140,000	1 0 0	15 0	Nov., 1898	14 15 0	15 0 0
Wolhuter, g	"	80,000	4 0 0	6 0	Aug., 1898	4 10 0	4 15 0
Worcester, g	"	100,000	1 0 0	3 0	Oct., 1898	2 12 6	2 17 6

† Dividend pending. § Rights or bonus pending. *Ex-dividend

PARIS.

Nov. 24

NAME OF COMPANY	Country.	Product.	Capital Stock.	Par value.	Latest divs.	Prices. Op'ning	Prices. Closing.
			Francs.	Fr.	Fr.	Fr.	Fr.
Acieries de Creusot	France	steel mfrs.	27,000,000	2,000	75.00	2,175.00	2,195.00
" " Firminy	"	" "	3,000,000	500	85.00	3,125.00	3,195.00
" " Fives-Lille	"	" "	12,000,000	500	35.00	538.50	550.00
" " Huta-Bank	Russia	iron & steel		500		4,625.00	4 62.50
" " la Marine	France	Steel mfrs	20,000,00	500	40.00	1,592.00	1,587.00
" " Longwy	"	" "		500	35.00	1,230.0	1,16 .00
Ansin	"	Coal			190.00	5,600.00	5,620.00
Biache-St. Vaast	"	Steel		1,000	160 00	3,800.00	3,800.00
Boieo	Lower Cal	Copper		500	93.50	1,885.0	1,89 .00
Briansk	Russia	Coal & Iron		500		1,268.75	1,282.50
Bruay	France	Coal	3,000,000	400	900 00	38,50 .00	38,383.00
Cape Copper	S. Africa	Copper	15,000,000	50	1.50	144 50	147.00
Champ d'Or	"	Gold	5,375,000	25		49.00	48 00
Courrieres	France	Coal	600,0 00	300	60.00	2,175.00	2,160.00
De Beers Consolidated	S. Africa	Diamonds	98,750,00	125	15.65	644 50	649.5
Denain-Anzin	France	Steel			50.00	79 0.0	79 .0
Dombrowa	Russia	Coal		500	12.50	998.0	993 0
Donetz	"	Steel				1,0 0.00	1,060.0
Dourges	"	Coal		1,000	300.00	21,672 00	21,100.00
Dynamite Centrale	France	Explosives		500	12.50	514 00	510.00
Epinac	"	Coal		2,500	20.83	600.00	600.00
Escombreras-Bleyberg	Spain	Lead		500	35.00	1,07 .0	1,50.00
Fraser River	Brit. Col'mb	Gold	250,0 0	25		8 25	8.50
Huanchaca	Bolivia	Silver	40,0 0,0	125	5.00	49.0	48 00
Langlaagte Estate	S. Africa	Gold	11,750,00	25	11.25	78 0	76.00
Lagunas	Chile	Nitrates	16,250,000	125	12.50	33.0	33 0
Laurium	Greece	Zinc & lead	16,300,000	500	35.00	615.00	610.00
Lautaro	Chile	Nitrates	13,750,0 0	125		0 0	100.00
Malfidano	Italy	Zinc	12,500,00	500	40 00	1,145 0	1,142.0
Metaux, Cie. Fran. de	France	Metal d'iers.	25,000,0	500	30.00	6 7.0	63.0
Mokta-el-Hadid	Algeria	Iron	18,312,50	500	40.00	1,16 .00	1, 5.00
Naphte Baku	Russia	Petroleum				7 1.00	694.0
Naphte, Le	"	"				2,600.00	2,65 .0
Naphte Nobel	"	"				52 .0	518.0
" parts	"	"				10 41 .0	10,15 .00
Nickel	N.Caled'nia	Nickel	6,360,0	500	30.00	245.00	301.00
Paccha-Jazpampa	Chile	Nitrates	9,0 0,0 0	125		12.50	12.50
Penarroya	Spain	Coal, etc		500	65.00	2,45 .0	2,450.0
Rebecca	Colo'do, U.S.	Gold	5,000,000	25		4.50	4 00
Rio Tinto,	Spain	Copper	40,625,000	125	47.50	776.00	767.0
" " preferred	"	"	40,625,00	125		151.0	152.00
Rive-de-Gier	France	Coal				22.50	23 00
Robinson	S. Africa	Gold	68,750,000	125	12.50	225.00	225 5
St. Etienne	France	Coal			18.00	463.50	463.00
Salines de l'Est	France	Salt		500	11.5	230. 0	235.00
Salines du Midi	France	" etc		5 0	20.00	925 00	918 50
Sels Gem. de la Rus. Mer	Russia	" etc		500	25.00	5 5.0	5 0 00
Tharsis	Spain	Copper	33,750,000	50	8.75	196 .0	194.00
Vicoigne-Neuix	France	Coal	1,000	1,000	700 00	23,80 .00	23,820.0
Vieille Montagne	Belgium	Zinc	9,000,000	80	3 .00	747.50	725.0

MEETINGS.

NAME OF COMPANY.	Location	Meeting.	Date.	Place.
Alice	Montana	Annual.	Jan. 11.	Salt Lake City, Utah
American Coal	Maryland	"	Dec. 29	1 Broadway, New York City
Anderes	Nevada	"	Dec. 19	309 Montgomery street, San Francisco, Cal.
Arcadia	Colorado	"	Jan 6	Colorado Springs, Colo.
Combination	Montana	"	Jan 12	Butte Montana
Copper Queen Con	Arizona	"	Dec 17	Salt Lake City, Utah.
Eureka Con	Nevada	Special	Dec. 20	3 0 Pine street, San Francisco, Cal.
Gene Field	Colorado	Annual.	Jan 17	Denver, Colo.
Gould & Curry	Nevada	"	Dec. 29	309 Montgomery street, San Francisco, Cal.
Holy Terror	S. Dakota	"	Jan 12	Milwaukee, Wis
Horseshoe Bar, C.	California	"	Jan. 17	340 Pine St., San Francisco, Cal
Hortense	Colorado	"	Feb. 1	Denver, Colo.
Kennedy	California	"	Dec. 19	San Francisco, Cal.
Mammoth	Utah	"	Feb. 1	310 Atlas Bldg, Salt Lake City, Utah.
Maryland Coal	Maryland	"	Feb. 1	No. 1 Broadway, New York City.
Mercur	Utah	"	Jan. 12	Salt Lake City, Utah.
Mt Diablo	California	"	Dec. 20	418 Pine street, San Francisco, Cal
Sierra Nevada	Nevada	"	Jan. 19	309 Montgomery street, San Francisco, Cal.
Swansea	Utah	Special.	Jan. 19	4 4 Dooly Block, Salt Lake City, Utah.

DIVIDENDS.

NAME OF COMPANY.	Current dividends. Date.	Current dividends. Am't.	Paid since Jan. 1, 1898.	Total to date.
Ætna Con	Jan. 2	10,000	$40,000	$160,000
Alaska-Mexican			72,000	321,381
Alaska-Treadwell			300,000	3,625,000
Alice, Mont			20,000	1,075,000
American Gold			54,000	362,000
†Anchoria-Leland	Dec.15	6,000	72,000	174,000
†Anaconda Copper			3,000,000	8,250,000
Argonaut			180,000	180,000
†Associated, Colo.			50,000	50,000
Atlantic			40,000	780,000
Aurora Iron			50,000	750,000
†Boston&Montana			1,950,000	9,125,000
†Bald Butte	Dec. 7	7,500	97,500	642,148
Breece	Dec. 1	10,000	10,000	30,000
†Bull.-Beck&Ch'n.	Dec.20	10,000	90,000	2,328,400
†Bunker Hill & S.	Dec. 5	21,000	228,000	600,000
Calumet & Hecla	Dec. 29	1,000,000	5,000,000	55,850,000
†Central Lead	Dec.	5,000	54,000	82,000
Centennial Eureka	Dec.15	15,000	15,000	2,025,000
Charleston, S. C.	Dec. 1	150,000	30,000	180,000
Colorado Sm.			250,000	1,845,000
Con. Tiger& Poor'n	Dec.29	20,000	20,000	20,000
Crowned K., Ariz.			96,000	208,000
De Lamar			115,200	2,451,600
†Elkton, Con			220,000	655,961
†Empire State, Ida	Dec.15	12,314	61,902	61,902
Enterprise, Colo.			50,000	900,000
Geyser-Marion			33,000	96 000
†Gold Coin, Vict.	Dec.25	10,000	12 ,000	14 ,000
†Golden Cycle			55,000	133,300
Golden Reward			15,000	155,000
†Grand Central, Ut	Dec.10	31,250	218,750	218,750
Hale & Norcross	Dec. 6	168,000	168,000	5,776,200
†Highland			220 00	3,764,718
Hope of St. Louis			20,000	762,252
Holy Terror			81,000	117,000
†Homestake	Dec.24	62,500	636,250	7,181 250
Horn Silver	Dec.31	20,000	80,000	5,230,000
Iron Mountain			10,000	597.500
Iowa			15,000	95,000
Jamison			39,000	39,000
Lillie	Dec. 1	$12,500	$37,500	$37,500
Mammoth	Dec. 1	20,500	200,000	1,350,000
Matoa	Dec.24	25,000	25,000	25,000
† Mercur	Dec.20	25,000	355,000	1,241,000
†Modoc	Dec.24	10,000	90,000	100,000
Montana, Lt'd			35,640	2,997,557
Mont. Ore Pur			160,000	800,000
†Moon-Anchor			150,000	261,0 0
Morning Star	Dec.	12,000	81,600	878,600
Mt. Rosa			20,000	60,000
Mountain Copper			31,250	93,750
Napa Con	Jan. 2	20,000	80,000	570,00
New Idria	Jan. 2	20,000	70,000	100,000
N. Y. & Hond. R.	Dec.20	15,000	120,000	975,000
†North Star, Cal.			50,000	500,000
Osceola	Dec.20	200,000	3 0,000	2,522,500
Parrot	Dec. 1	69,000	413,910	2,138 898
†Pennsylvania	Dec.	2,575	28,325	51,650
Pioneer	Dec.15	12,500	50,000	50,000
†Portland	Dec 15	60,000	570,000	2,227,08
Quincy			650,000	10,120,000
†Republic, Wash	Dec.10	30,000	90,000	90,000
Sacramento			40,000	57,000
†Silver King	Dec.10	37,500	450,000	1,800,000
Small Hopes			25,00	3,300,000
†Smuggler			110,00	1,085,000
So. Eureka, Cal			12, 00	12,000
South Swansea			30,000	104,95
St. Joseph Lead	Dec.21	37,500	112,500	2,781,500
Standard Con			27,0 0	5,674,940
†Strong	Dec.	25,000	175,000	445,0 0
†Swansea	Dec 10	10,000	65,000	136,500
Tamarack	Dec.28	240,000	440,000	5,570,000
Victor	Dec. 1	100,000	350 000	1,155.00
Vindicator			137,875	137,875
†War Eagle, B. C.	Dec.15	26,250	177,750	177,750
Wolverine			60,000	60,000
†Yellow Aster			119,000	158,780
Totals			$2,616,389	$19,979,951	177,428,474

† November dividend paid.

ASSESSMENTS.

NAME OF COMPANY.	Location.	No.	Delinq.	Sale.	Amt.
Alta	Nev.	60	Nov. 22	Dec. 20	.05
Alpha	"	21	" 28	" 19	.03
Alaska	Utah		Dec. 13	" 27	.01
Arrastraville	Cal.	2	" 17	Jan. 17	.10
Best & Belcher	Nev.	65	Nov. 24	Dec 13	.10
*Central Eureka	Cal.		Jan. 9		.01½
Confidence	Nev.	31	Nov. 23	Dec. 14	.10
Con. St. Gothard	Cal	16	Dec. 14	" 30	.10
Gould & Curry	Nev.	85	" 8	" 29	.10
Great West. Q.	Cal.	4	" 16	Jan. 16	.15
*Hor'shoe B'r C'n	"	11	Jan. 4	Jan. 30	.05
*Junction	"	22	" 9	" 30	.03
May Day	Utah		" 3	" 22	.00½
Mexican	Nev.	60	Nov. 22	Dec. 13	.10
Morgan (Mec'rs)	Utah	2	Dec. 12	Jan. 5	.03
*Montreal	"		Jan. 10	Feb. 15	.05
*Morning Star	Nev.		Dec. 21	Jan. 21	.01½
Mt. Diablo	"	6	Dec. 28	Jan. 20	.10
No. Gould & Curry	Nev.	21	" 20		.10
Occidental Con.	"	31	" 3	Dec. 28	.10
Overman (New)	"	1	Dec. 11	Jan. 4	.05
Poto-i	"	51	" 5	Dec. 28	.10
South Eureka	Cal	25	" 16	Jan. 16	.03
*Tetro	Utah	6	Jan. 7	Feb. 4	.01
Troy	Alaska	5	Dec. 27	Jan. 11	.06¼
Union Con	Nev.	57	Jan. 3	" 23	.03

* New assessment.

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par Val	Assessments. Total Levied.	Assessments. Date and Amount of Last.			Dividends. Total Paid.	Dividends. Date and Amount of Last.		
1	Adams, s. l. c.	Colo..	$1,500,000	150,000	$10	*	.....	....	.....	$693,500	Oct..	1895	.04
2	Etna Cons., q.	Cal ..	500,000	100,000	5	*	.....	....	.....	150,000	Oct..	1898	.10
3	Alaska-Mexican, g.	Alask	1,000,000	200,000	5	.....	.....	....	.....	317,031	Nov..	1898	.10
4	Alaska-Treadwell, g.	Alask	5,000,000	200,000	25	*	.....	....	.....	3,925,000	Nov..	1898	.37½
5	Alice, g. s.	Mont.	10,000,000	400,000	25	*	.....	....	.....	1,075,000	April.	1898	.05
6	American Gold, g. s. c.	Colo..	3,000,000	300,000	10	*	.....	....	.....	302,000	Oct..	1898	.09
7	Anaconda Copper	Mont.	30,000,000	1,200,000	25	.....	.....	....	.....	8,250,000	Nov.	1898	1.25
8	Anchoria-Leland, g.	Colo..	600,000	600,000	1	*	.....	....	.....	168,000	Nov..	1898	.01
9	Argentum Juniata, g. s. l	Colo..	2,600,000	1,300,000	2	*	.....	....	.....	39,000	July..	1895	.03
10	Associated, g.	Colo.	1,250,000	1,250,000	1	*	.....	....	.....	50,000	Nov..	1898	.01
11	Atlantic, c.	Mich.	1,000,000	40,000	25	.....	.....	....	.....	780,000	Feb..	1898	1.00
12	Aurora, l.	Mich.	2,500,000	100,000	25	*	.....	....	.....	750,000	May..	1898	.50
13	Bald Butte.	Mont.	250,000	250,000	1	*	.....	....	.....	642,148	Dec..	1898	.03
14	Bangkok-Cora Bell, s. l.	Colo..	600,000	600,000	1	.....	.....	....	.....	107,510	July..	1896	.01
15	Big Six, g. s.	Colo..	500,000	500,000	1	.....	.....	....	.....	15,000	May..	1898	.00½
16	Boston & M. Cons., g. s. c.	Mont.	3,750,000	150,000	25	*	.....	....	.....	9,125,000	Nov..	1898	5.00
17	Breece, i.	Colo.	5,000,000	200,000	25	.....	.....	....	.....	30,000	Dec..	1898	.05
18	Bullion Beck & Champ.	Utah.	1,000,000	100,000	10	*	.....	....	.....	2,318,400	Nov..	1898	.10
19	Bunker Hill & S., s. l.	Idaho	3,000,000	300,000	10	.....	.....	....	.....	600,000	Dec..	1898	.07
20	Calumet & Hecla, c.	Mich.	2,500,000	100,000	25	.....	.....	....	.....	55,850,000	Dec..	1898	10.00
21	Cariboo, g.	B. C..	800,000	800,000	1	.....	.....	....	.....	236,965	Aug..	1898	.02
22	Centen'l-Eureka, g. s. l. c	Utah.	1,500,000	30,000	50	30,000	Mar..	1889	1.00	2,010,000	Mar..	1897	1.00
23	Central Lead, l.	Mo...	1,000,000	10,000	100	*	.....	....	.....	82,000	Dec..	1898	.50
24	Champion, g. s.	Cal...	340,000	34,000	10	.....	.....	....	.....	296,200	April.	1898	.25
25	Charleston, p. r.	S. C..	1,000,000	10,000	100	*	.....	....	.....	180,000	Dec..	1898	1.50
26	Colorado, Sm., g. s. c.	Mont.	1,000,000	100,000	10	*	.....	....	.....	1,845,000	Oct..	1898	.50
27	** Cons. Cal. & Va.	Nev..	540,000	216,000	2½	678,000	July..	1898	.25	3,894,000	Feb..	1895	.25
28	Con. Tiger & Poorman	Idaho	1,000,000	1,000,000	1	*	.....	....	.....	20,000	Dec..	1898	.02
29	Crowned King, g. s. l.	Ariz .	6,000,000	600,000	10	*	.....	....	.....	208,000	Oct..	1898	.02
30	Dalton & Lark, s. l.	Utah.	2,500,000	2,500,000	1	.....	.....	....	.....	87,500	Aug..	1896	.00½
31	Daly, s. l.	Utah.	3,000,000	150,000	20	.....	.....	....	.....	2,925,000	Mar..	1897	.25
32	†Deadwood-Terra, g.	S. D..	5,000,000	200,000	25	*	.....	....	.....	1,350,000	May..	1898	.15
33	De Lamar, g. s.	Idaho	2,000,000	400,000	5	.....	.....	....	.....	2,451,600	May	1898	.20
34	Della S.	Colo..	1,000,000	1,000,000	1	.....	.....	....	.....	60,000	Jan..	1897	.10
35	Dutch, g	Cal ..	1,500,000	150,000	10	.....	.....	....	.....	39,000	Feb..	1898	.04½
36	Elkton Cons., g.	Colo..	1,250,000	1,250,000	1	.....	.....	....	.....	656,961	Nov..	1898	.01½
37	El Paso, g. s.	Colo..	650,000	650,000	1	.....	.....	....	.....	12,093	Jan..	1898	.01
38	Enterprise, s. l.	Colo..	500,000	500,000	1	.....	.....	....	.....	900,000	Sept..	1898	.05
39	Empire State-Idaho.	Idaho	1,000,000	100,000	10	.....	.....	....	.....	61,902	Dec..	1898	.10
40	Fern.	B.C..	200,000	200,000	1	.....	.....	....	.....	10,000	Jan..	1898	.05
41	Florence, s.	Mont.	2,500,000	500,000	5	*	.....	....	.....	137,530	Aug .	1897	.01
42	Franklin, c.	Mich.	1,000,000	40,000	25	.....	.....	....	.....	1,240,000	Jan..	1894	2.00
43	Galena, g. s. l.	Utah.	1,000,000	100,000	10	.....	.....	....	.....	71,000	Jan..	1897	.05
44	Garfield-Grouse, g.	Colo..	1,200,000	1,200,000	1	*	.....	....	.....	24,000	Feb..	1897	.01
45	Geyser-Marion, g.	Utah.	1,500,000	300,000	5	.....	.....	....	.....	96,000	Sept..	1898	.02
46	Gold Coin, g. s.	Colo..	1,000,000	200,000	5	*	.....	....	.....	160,000	Nov..	1897	.05
47	Gold Coin of Victor, g.	Colo..	1,000,000	1,000,000	1	.....	.....	....	.....	130,000	Nov..	1898	.01
48	Golden Cycle, g.	Colo..	1,000,000	200,000	5	.....	.....	....	.....	148,300	Oct..	1898	.02½
49	Golden Fleece, g. s.	Colo..	600,000	600,000	1	*	.....	....	.....	569,179	Feb..	1897	.01
50	Gold & Globe, g.	Colo..	750,000	750,000	1	.....	.....	....	.....	51,625	July..	1897	.00⅔
51	Golden Reward, g.	S. D..	1,000,000	100,000	10	.....	.....	....	.....	155,000	Feb..	1898	.15
52	Grand Central, g.	Utah.	250,000	250,000	1	.....	.....	....	.....	218,750	Dec..	1898	.12½
53	Hall Mines, Ltd	B. C..	1,250,000	250,000	5	.....	.....	....	.....	160,000	May .	1898	.25
54	Hecla Cons., g. s. c. l.	Mont.	1,500,000	30,000	50	*	.....	....	.....	2,175,000	Feb..	1897	.50
55	Helena & Frisco, s. l.	Idaho	2,500,000	500,000	5	*	.....	....	.....	475,000	Aug..	1896	.04
56	Highland, g.	S. D..	10,000,000	100,000	100	304,000	.....	....	.....	3,764,718	Nov..	1898	.20
57	Holy Terror, g.	S. D..	500,000	500 000	1	.....	.....	....	.....	117,000	Sept..	1898	.03
58	Homestake, g.	S. D.	12,500,000	125,000	100	200,000	July..	1878	1.00	7,118,750	Nov..	1898	.50
59	Hope of St. Louis, s.	Mont.	1,000,000	100,000	10	*	.....	....	.....	702,252	Mar..	1898	.10
60	Horn-Silver, g. s. c. sp. l	Utah.	10,000,000	400,000	25	*	.....	....	.....	5,210,000	Dec..	1898	.05
61	Idaho.	B. C..	500,000	500,000	1	.....	.....	....	.....	264,000	May..	1898	.05
62	Iowa, g.	Colo..	1,000,000	1,000,000	1	.....	.....	....	.....	95,000	June.	1898	.00½
63	Iron Mountain, g. s. l. i.	Mont.	5,000,000	500,000	10	*	.....	....	.....	507,500	April.	1898	.02
64	Isabella, g.	Colo.	2,250,000	2,250,000	1	.....	.....	....	.....	270,000	June.	1897	.00½
65	Jersey Leasing	Colo..	200,000	158,167	1	.....	.....	....	.....	137,875	Oct..	1898	.03½
66	Kennedy, g.	Cal ..	10,000,000	100,000	100	.....	.....	....	.....	1,796,000	Aug..	1898	.48
67	Last Chance, g. s. l.	B. C..	500,000	500,000	1	*	.....	....	.....	40,000	Jan..	1897	.04
68	Le Roi.	B. C..	2,500,000	500,000	5	.....	.....	....	.....	825,000	April.	1898	.10
69	§§Lillie, g.	Colo..	1,250,000	250000	5	.....	.....	....	.....	37,500	Dec..	1898	.05
70	Mammoth, g. s. c.	Utah.	10,000,000	400,000	25	*	.....	....	.....	1,350,000	Dec..	1898	.05
71	Mayflower, g.	Cal .	1,200,000	60,000	20	6,000	Sept..	1898	.05	166,824	Dec..	1895	.10
72	Mercur, g.	Utah.	5,000,000	200,000	25	*	.....	....	.....	1,216,000	Nov..	1898	12½
73	Minnesota Iron, i.	Minn.	16,500,000	165,000	100	*	.....	....	.....	4,735,000	Oct..	1898	1.50
74	Modoc, g.	Colo..	500,000	500,000	1	.....	.....	....	.....	100,000	Dec..	1898	.01
75	Mollie Gibson, s.	Colo.	5,000,000	1,000,000	5	20,000	Jan..	1891	.02	4,080,000	Jan..	1895	.05
76	Montana, Ltd., g. s.	Mont.	3,300,000	660,000	5	*	.....	....	.....	2,997,557	May .	1898	.05¾
77	Montana Ore Purchas'g	Mont.	2,500,000	80,000	25	*	.....	....	.....	800,000	Oct..	1898	1.00
78	Moon-Anchor, g.	Colo..	600,000	600,000	1	*	.....	....	.....	261,000	Nov..	1898	.07½
79	Moose, g.	Colo..	600,000	600,000	1	.....	.....	....	.....	186,000	Jan..	1896	.01
80	Morning Star, g.	Cal...	240,000	2,400	100	70,800	Feb..	1887	.75	678,600	Dec..	1898	5.00
81	Mt. Rosa, g.	Colo..	1,000,000	1,000,000	1	.....	.....	....	.....	60,000	Jan..	1898	.02
82	Mountain Copper	Cal ..	6,250,000	250,000	25	.....	.....	....	.....	93,750	Sept..	1898	.62½
83	Napa Cons., q.	Cal ..	700,000	100,000	7	*	.....	....	.....	950,000	Oct..	1898	.20
84	New Idria Quicksilver.	Cal...	500,000	100,000	5	.....	.....	....	.....	80,000	Oct..	1898	.20
85	N.Y. & Hon Rosario, s. g.	C. A..	1,500,000	150,000	10	*	.....	....	.....	975,000	Dec..	1898	.10
86	North Star, g.	Cal ..	2,000,000	300,000	10	20,000	June.	1895	.02	500,000	Nov..	1898	.25
87	Ontario, s. l.	Utah.	15,000,000	150,000	100	.....	.....	....	.....	13,557,500	Nov..	1897	.75
88	Osceola, c.	Mich.	2,500,000	100,000	25	*	.....	....	.....	2,522,500	Dec..	1898	2.00
89	Parrot, c.	Mont.	2,300,000	230,000	10	*	.....	....	.....	2,138,898	Dec..	1898	.30
90	Pennsylvania Cons.	Cal...	5,150,000	51,500	100	14,000	Feb..	1892	.05	51,350	Dec..	1898	.05
91	Pioneer g.	Cal...	1,000,000	100,000	10	.....	.....	....	.....	50,000	Dec..	1898	.12½
92	Portland, g.	Colo..	3,000,000	3,000,000	1	*	.....	....	.....	2,227,080	Dec..	1898	.02
93	Princess, g.	Colo..	1,000,000	1,000,000	1	.....	.....	....	.....	45,000	Feb..	1897	.00½
94	Quincy, c.	Mich.	2,500,000	100,000	25	*	.....	....	.....	10,120,000	Aug..	1898	3.50
95	Rambler-Cariboo	B. C..	1,000,000	1,000,000	1	.....	.....	....	.....	40,000	April.	1897	.02
96	Raven, g.	Colo..	1,500,000	1,500,000	1	.....	.....	....	.....	20,000	Mar..	1898	.01
97	Reco, s. l.	B. C..	1,000,000	1,000,000	1	.....	.....	....	.....	297,500	Jan..	1898	.10
98	Republic, g.	Wash	1,000,000	1,000,000	1	.....	.....	....	.....	90,000	Dec..	1898	.03
99	Sacramento, g.	Utah.	5,000,000	1,000,000	5	.....	.....	....	.....	57,000	Sept..	1898	.00½
100	St. Joseph, l.	Mo...	3,000,000	300,000	10	*	.....	....	.....	2,784,500	Dec..	1898	1.50
101	Santa Rosalia, g. s.	Cal...	100,000	100,000	1	.....	.....	....	.....	125,000	Feb..	1898	.10
102	Silver King, g. s. l.	Utah.	3,000,000	150,000	20	3,000	Jan..	1897	.02	1,800,000	Dec..	1898	.25
103	Slocan Star.	B. C.	1,000,000	2,000,000	0.50	.....	.....	....	.....	400,000	Mar..	1897	.05
104	Small Hopes, s.	Colo..	5,000,000	250,000	20	*	.....	....	.....	3,300,000	June.	1898	.10
105	Smuggler Union, g. s.	Colo..	5,000,000	50,000	100	.....	.....	....	.....	150,000	Oct..	1896	1.00
106	Smuggler, s. l. z.	Colo..	1,000,000	1,000,000	1	.....	.....	....	.....	1,085,000	Nov..	1898	.01
107	South Swansea, s. l.	Utah.	150,000	150,000	1	.....	.....	....	.....	104,950	Aug..	1898	.05
108	Standard Cons., g. s.	Cal...	20,000,000	200,000	100	.....	.....	....	.....	5,674,940	Aug..	1898	.10
109	Swansea, s. l.	Utah.	500,000	100,000	5	.....	.....	....	.....	136,500	Dec..	1898	.10
110	Tamarack, c.	Mich.	1,500,000	60,000	25	.....	.....	....	.....	5,570,000	Dec..	1898	4.00
111	Tomboy, g.	Colo..	2,000,000	200,000	10	*	.....	....	.....	690,000	Dec..	1896	.10
112	Union, g.	Colo..	1,250,000	1,250,000	1	.....	.....	....	.....	73,000	June.	1896	.01
113	Union Leasing.	Colo..	500,000	500,000	1	.....	.....	....	.....	340,000	July..	1895	.04
114	Utah.	Utah.	1,000,000	100,000	10	*	.....	....	.....	177,000	Dec..	1897	.01
115	Victor, g.	Colo..	1,000,000	200,000	5	*	.....	....	.....	1,155,000	Dec..	1898	.50
116	Vindicator, Cons. g.	Colo..	1,500,000	1,015,000	1	.....	.....	....	.....	137,875	Oct..	1898	.05
117	§§ War Eagle, Cons.	B. C..	2,000,000	1,750,000	1	.....	.....	....	.....	177,750	Dec..	1898	.01½
118	Western Mine Enterp.	Mont.	500,000	500,000	1	*	.....	....	.....	48,680	Jan..	1898	.20
119	Whitewater.	B. C..	625,000	125,000	5	.....	.....	....	.....	194,000	April.	1898	.32
120	Wolverine, c.	Mich.	‖ 1,500,000	60,000	25	180,000	Mar..	1895	1.00	60,000	Oct..	1898	1.00
121	Yellow Aster, g.	Cal...	1,000,000	100,000	10	*	.....	....	.....	168,789	Dec..	1898	.10

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par Val	Assessments. Total Levied.	Assessments. Date and Amount of Last.		
1	Ada Cons., s. l.	Utah.	$100,000	100,000	$1	$3,333	Nov..	1895	.01½
2	Alamo, g. c. i.	Utah.	125,000	125,000	1	937	Mar..	1898	.00¾
3	Alliance, g. s. l.	Utah.	100,000	100,000	1	200,000	Dec..	1895	.10
4	Allonez, c.	Mich.	2,000,000	80,000	25	80,000	June.	1890	1.00
5	** Alpha Cons., g. s.	Nev..	105,000	105,000	1	316,050	Nov..	1898	.03
6	** Alta, s.	Nev..	216,000	108,000	2	3,664,910	Nov..	1898	.05
7	American Quartz, g.	Cal...	1,000,000	100,000	10	1,000	Feb..	1897	.01
8	Anchor, g. s. l.	Utah.	1,500,000	150,000	10	560,000	Aug..	1893	.20
9	** Andes, g.	Nev..	300,000	100,000	3	1,195,000	Sept..	1898	.05
10	Baliol, g.	Cal...	1,000,000	100,000	10	55,000	Mar..	1898	.30
11	** Belcher, s. g.	Nev..	312,000	104,000	3	3,514,800	Nov..	1898	.10
12	Belle Isle.	Nev..	10,000,000	100,000	100	240,271	July..	1896	.10
13	Benton Con. s.	Nev..	10,800,000	108,000	100	587,023	June.	1897	.25
14	**Best & Belcher, g. s	Nev..	302,400	100,800	3	2,589,643	Nov..	1898	.10
15	Bogan.	Utah.	1,250,000	125,000	10	26,875	Dec..	1897	.01½
16	Boston & Cp. Clk., g.	Colo..	400,000	200,000	2	30,000	Aug..	1898	.10
17	Brunswick Cons., g.	Cal...	500,000	500,000	1	160,000	July..	1897	.03
18	** Bullion, s. g.	Nev..	100,000	100,000	1	3,120,000	Nov..	1898	.05
19	Caledonia,	Nev..	300,000	300,000	3	3,210,000	ov..	1897	.10
20	Centennial, c.	Mich.	2,500,000	100,000	25	460,000	Mar..	1898	3.00
21	Central Eureka, g.	Cal...	4,000,000	400,000	10	78,000	Nov..	1898	.03
22	**Challenge Cons, s. g.	Nev..	150,000	50,000	3	427,500	May	1898	.10
23	** Chollar, g. s	Nev..	336,000	112,000	3	2,048,600	Nov..	1898	.10
24	** Confidence, g. s.	Nev..	74,880	24,960	3	540,126	Nov..	1898	.10
25	**Cons. Imperial, g. s	Nev..	500,000	500,000	1	2,246,000	Nov..	1898	.01
26	** Con. New York	Nev..	100,000	100,000	1	160,500	Nov..	1898	.03
27	** Crown Point, g. s.	Nev..	300,000	100,000	3	2,970,000	Nov..	1898	.10
28	Dalton, s. l.	Utah.	2,500,000	500,000	5	7,500	Sept.	1898	.00½
29	Dexter.	Nev..	1,000,000	200,000	5	30,000	Apr..	1898	.15
30	Eagle, g. s.	Cal...	500,000	100,000	5	5,000	Dec..	1896	.05
31	Eagle, g. s.	Ore ..	1,000,000	100,000	10	6,000	Oct..	1898	.01½
32	Emerald.	Utah	300,000	300,000	1	3,000	Oct..	1898	.00⅔
33	Eureka Cons., g. s. l.	Nev..	1,000,000	50,000	20	585,000	Sept.	1898	.20
34	Eureka Con. Drift, g.	Cal...	500,000	500,000	1	172,500	Nov..	1898	.00½
35	** Exchequer, g. s.	Nev..	1000,000	100,000	1	1,020,000	Dec..	1897	.05
36	Four Aces.	Utah.	250,000	250,000	1	5,000	Mar .	1898	.01
37	Galena.	Utah.	1,000,000	100,000	10	10,000	Oct..	1898	.10
38	Geyser, s. l.	Colo..	5,000,000	500,000	10	1,075,000	Aug..	1898	.10
39	Gold Belt, g. s.	Utah.	500,000	500,000	1	3,012	July..	1896	.00½
40	Golden Fleece Grav. g	Cal...	130,000	130	1000	56,260	Mar..	1897	2.00
41	Gold King, g.	Colo..	1,000,000	1,000,000	1	*	.....	.....	.....
42	** Gould & Curry	Nev..	324,000	108,000	3	4,614,350	Dec..	1898	.10
43	Great Eastern, g.	Utah.	1,500,000	300,000	5	5,000	Oct..	1898	.00½
44	Hale & Norcross, g. s.	Nev..	11,200,000	112,000	100	5,688,280	Apr..	1898	.10
45	Horse Shoe Bar Cons.	Cal...	6,000,000	60,000	100	85,800	Jan..	1899	.02
46	Idlewild, g.	Cal...	1,000,000	100,000	10	*	.....	.....	.....
47	Iron Silver, s. l.	Colo..	10,000,000	500,000	20	*	.....	.....	.....
48	Jackson, l.	Mich.	300,000	12,000	25	*	.....	.....	.....
49	Jupiter, g.	Cal...	2,000,000	20,000	100	80,000	Feb..	1898	.20
50	** Julia Con.	Nev..	110,000	110,000	1	1,495,500	Feb..	1897	.05
51	** Justice, g. s. c.	Nev..	210,000	105,000	2	3,646,750	Nov..	1898	.10
52	Kentuck.	Utah.	600,000	300,000	2	3,000	Aug..	1898	.10
53	** Kentuck Cons., s.	Nev..	105,000	105,000	1	125,300	June.	1898	.05
54	Keystone, g.	Colo..	1,500,000	1,500,000	1	*	.....	.....	.....
55	Lacrosse, g.	Colo..	1,000,000	100,000	10	*	.....	.....	.....
56	Little Pittsburg.	Utah.	2,000,000	400,000	5	18,000	Dec..	1898	.01
57	Lower Mammoth.	Utah.	150,000	150,000	1	15,000	Oct..	1898	.05
58	Lucky Bill.	Utah.	300,000	120,000	2.50	54,600	June.	1898	.01½
59	Marguerite, g.	Cal...	500,000	50,000	10	70,000	Nov..	1898	.10
60	May Day.	Utah.	100,000	400,000	¼	4,000	Jan..	1899	.00½
61	Mayday, g. s.	Cal...	50,000	50,000	1	5,000	May..	1898	.10
62	Mayflower, g.	Colo..	1,000,000	1,000,000	1	*	.....	.....	.....
63	Merced, g.	Cal...	1,500,000	100,000	15	200,000	July..	1896	2.00
64	Meteor, s. l.	Utah.	600,000	300,000	2	3,731	Oct..	1898	.00½
65	** Mexican, g. s.	Nev..	302,400	100,800	3	2,258,720	Nov..	1898	.10
66	Monarch, g.	Colo..	1,000,000	1,000,000	1	.....	.....	.....	.....
67	Montreal.	Utah.	2,500,000	250,000	10	5,250	Nov..	1897	.00¼
68	Mt. Diablo s.	Nev..	5,000,000	50,000	100	145,000	Nov..	1896	.10
69	Nashville, g.	Cal ..	115,000	11,500	10	2,000	Sept..	1898	.17
70	New Gold Hill.	N. C..	1,750,000	350,000	5	.....	.....	.....	.....
71	New Viola, s. l.	Idaho	750,000	150,000	5	*	.....	.....	.....
72	North Banner, g. s.	Cal...	1,000,000	100,000	10	21,794	Oct..	1896	.02
73	North Belle Isle, s.	Nev..	10,000,000	100,000	100	523,074	July..	1896	.10
74	***No. Gould & Curry	Nev..	100,000	100,000	1	375,000	Dec..	1898	.10
75	Northern Light, g.	Utah.	2,000,000	400,000	5	80,000	July..	1898	.10
76	**Occidental Cons g s	Nev..	300,000	100,000	3	499,179	Dec..	1898	.10
77	** Ophir, g. s.	Nev..	324,000	108,000	3	4,602,568	Sept.	1898	.15
78	Opohonga.	Utah.	200,000	100,000	2	1,500	June.	1898	.01
79	Oro Cache, g. s.	S. D..	1,250,000	250,000	5	6,250	July..	1893	.00½
80	Osceola, g.	Cal ..	10,000,000	100,000	100	10,924	Sept..	1898	.01
81	*** Overman, g. s.	Nev..	230,400	115,200	2	4,129,690	Dec..	1898	.05
82	Peer, s.	Ariz..	10,000,000	100,000	100	215,000	July..	1894	.05
83	Peerless, s.	Nev..	10,000,000	100,000	100	410,000	July..	1894	.05
84	Pine Hill, g.	Cal ..	1,000,000	100,000	10	30,000	July..	1897	.05
85	** Potosi, g. s.	Nev..	336,000	112,000	3	2,157,200	Dec..	1898	.10
86	Puritan, g. s.	Colo..	1,500,000	150,000	10	*	.....	.....	.....
87	Quicksilver, pref., q.	Cal ..	4,300,000	43,000	100	*	.....	.....	.....
88	Quicksilver, com. q.	Cal ..	5,700,000	57,000	100	*	.....	.....	.....
89	Red Mountain, s.	Colo..	300,000	60,000	5	22,500	Mar..	1891	.12½
90	Rescue, g.	Nev..	100,000	10,000	10	4,000	June.	1898	.10
91	Reward, g.	Cal...	64,000	64,000	1	63,680	Nov..	1898	.02
92	Ridge, c.	Mich.	500,000	20,000	25	239,939	Feb..	1897	1.00
93	St. Mary, c.	Mich.	1,000,000	40,000	25	4,000	July..	1895	.05
94	** Savage, g. s.	Nev..	280,000	112,000	2½	7,298,600	Nov..	1898	.10
95	Scorpion, s.	Nev..	100,000	100,000	1	445,000	Dec..	1897	.05
96	**Seg. Belcher & M g s	Nev..	200,000	100,000	2	368,000	Nov..	1898	.03
97	Sevier, g. s.	Utah.	1,250,000	250,000	5	50,000	April.	1897	.04
98	**Sierra-Nevada, g. s	Nev..	300,000	100,000	3	6,706,919	Feb..	1898	.20
99	Silver Age, g. s. l.	Colo..	2,000,000	200,000	10	*	.....	.....	.....
100	** Silver Hill, s.	Nev..	108,000	108,000	1	2,220,200	May	1898	.05
101	Silver King, s.	Ariz.	10,000,000	100,000	100	395,000	Oct..	1898	.25
102	Silver Queen, c.	Ariz..	5,000,000	200,000	25	*	.....	.....	.....
103	Silver State, g.	Colo..	700,000	700,000	1	*	.....	.....	.....
104	Silver State, s. g. l.	Utah.	100,000	100,000	1	1,000	Sept..	1897	.00½
105	Siskiyou Con., s.	Cal ..	2,000,000	200,000	10	46,000	Apr..	1898	.01
106	South Fork Con.	Utah.	50,000	50,000	1	5,000	Mar..	1898	.01
107	Star, g. s.	Utah.	1,000,000	200,000	5	1,000	Mar..	1898	.00½
108	Sunbeam Cons.	Utah.	250,000	250,000	1	23,125	Nov..	1898	.01
109	Tecumseh, c.	Mich.	1,000,000	40,000	25	40,000	July..	1897	1.00
110	Temonj, g.

CHEMICALS, MINERALS, RARE ELEMENTS, ETC.—CURRENT PRICES.

NOTE.—These quotations are for wholesale lots in New York unless otherwise specified, and are generally subject to the usual trade discounts. This table is revised up to Dec. 1st. Readers of the ENGINEERING AND MINING JOURNAL are requested to report any corrections needed, or to suggest additions which they may consider advisable. See also Market Review of Chemicals and Minerals.

	Cust. Meas.	Price.
Abrasives—		
Carborundum, f.o.b. Niagara Falls grains	lb.	$0.15
Powdered	"	.10
Corundum, N. C.	"	.07@.10
Chester	"	.04½@.05
Emery, Turkish flour	"	.03
Grains	"	.05
Naxos flour	"	.03
Grains	"	.05
Chester flour	"	.03
Grains	"	.05
Peekskill flour	"	.01¾
Grains	"	.02½
Crude, Kuluk, best	lg. ton	18.50
Levant,	"	22.00
Naxos (Greek) best	"	32.00
Pumice Stone, powdered	lb.	.01½@1.85
Lump, per quality	"	.04@.40
Rottenstone, ground	"	.02
Lump, according to quality	"	.06@.18
Rouge	"	.17@.30
Tripoli, prepared	sh. ton.	12.00
Acids—Acetic, 30% pure	lb.	.02¾
30% ch. pure	"	.06½
80% pure	"	.09
Glacial, pure	"	.10¾
Chem. pure	"	.21
Benzoic, English	"	1.10
German	"	.48
Boracic, pure cryst	"	.09@.10¼
Powdered	"	.09½@.10¾
Carbolic, cryst. in drums	"	.16
Carbonic, liquid	"	.12½
Chromic, crude	"	.25
Chem. pure	"	.40
Absol. ch. pure	"	1.75
Hydrochloric, ch. pure	"	.08
Hydrofluoric, 30%	"	.03@.04½
48%	"	.05@.06
Best	"	.25
Nitric, chem. pure	"	.10
Sulphuric, 98%	"	.02
Chem. pure	"	.07
Sulphurous	"	.05
Tartaric, cryst	"	.31½@.32
Powder	"	.32@.32½
Alcohol—94%	gal.	2.40@2.44
Refined wood, 95@97%	"	.75@.80
Purified	"	1.20@1.50
Alum—Lump	100 lbs.	1.65
Powdered	"	2.50
Ground	"	1.75
Chrome, com'l	"	3.50
Aluminum—Nitrate	lb.	1.50
Oxide, com'l	"	.20
Pure	"	.80
Chem. pure	"	1.00
Hydrated	"	.05
Sulphate, pure	"	.02
Ammonia—Aqua, 16°	"	.02½@.03
18°	"	.03@.03½
20°	"	.03½@.04
26°	"	.05½@.06
Ammonium—		
Acetate, cryst	"	.65
Bromide, pure	"	.52@.53
Carbonate	"	.07¼@.07½
Muriate, gran., white	"	.05¾
Lump	"	.08¼
Gray	"	.05
Nitrate, white, pure (99%)	"	.09
Antimony—Glass	"	.30@.40
Needle, lump	"	.05@.06
Powdered	"	.07@.08½
Oxide, com'l white, 95%	"	.20
Com'l white, 99%	"	.35
Sulphuret	"	.16
Arsenic—White	"	.04@.04½
Red	"	.07¾@.08
Asphaltum—California Ventura	sh. ton	32.00
Cuban, best	"	40.00
Common	"	18.00
Trinidad, refined	"	30.00
Gilsonite, Utah, ordinary	sh. ton	40.00
Select	"	60.00
Barium—Carbonate, lump, 80%	"	25.00
90%	"	27.50
92@94%	"	25.25
96@98%	"	29.00
Powdered, 80%	lb.	.01¾
90%	"	.02
Chloride, com'l	"	.02¼
Chem. pure cryst	"	.05
Chlorate	"	.28
Nitrate, com'l, pow'd.	"	.07
Pure, pow'd	"	.07@.08
Oxide, com'l, hyd. cryst	"	.18@.22
Hydrated, pure cryst.	"	.25
Pure, powd	"	.27
Sulphide	"	.40
Sulphate	"	.02¼@.02¾
Barytes—Crude, No. 1	sh. ton	9.00@10.00
No. 2	"	8.00@8.25
No. 3	"	7.75@8.00
Prime White	"	12.00@15.00
American, floated	"	12.50@18.00
Foreign, floated	"	19.50@21.00
Bauxite—Georgia, f.o.b. cars, first grade	lg. ton	3.25@4.50
Second grade	"	3.00
Alabama, f. o. b. cars Rock Run	"	3.85
Benzole—90%	gal.	1.00@1.10
Bismuth—Oxide, hydr.	lb	2.25@2.56
Nitrate cryst	oz.	.09
Bitumen	lb.	.03½@.05
Bone Ash	"	.02¾@.03½
Borax—		
Cryst. and pow'd	"	.07
Calcined	"	.20
Bromine—		
Bulk	"	.45

	Cust. Meas.	Price.
Cadmium—		
Metallic	lb.	1.90@2.00
Sulphide	"	3.25@4.00
Sulphate	oz.	.14
Calcium—		
Carbide, in ton lots, f. o. b. Niagara Falls, N.Y.	lb.	.03@.04
Acetate, pure white	"	.10
Carbonate, ppt	"	.05
Chem. pure	"	.75
Chloride	100 lbs.	.90
Sulphite	lb.	.05
Sulphide	"	.20
Cement—		
Portland, Am., 400 lbs	bbl.	1.80@2.00
Foreign	"	1.75@2.50
"Rosendale," 300 lbs	"	.65
Sand cement, 400 lbs	"	1.85@1.95
Slag cement, imported	"	1.65
Ceresine—		
Orange and Yellow	"	.10@.10½
White	"	.11½@.13½
Chalk—Com'l, lump	sh. ton	2.00@2.10
Ppt	lb.	.04@.04½
French	100 lbs.	.30@.35
Chrome Ore—		
(50% chrome) ex ship	lg. ton	24.50
Clay, China—Am. com.	sh. ton	7.50
Am. best	"	8.50
English, common	"	11.00@12.50
Best grade	"	15.00
Fire, ground, f.o.b. Jersey City, N. J	"	4.00@5.00
Slip Clay, f.o.b. Albany	"	3.00
Cobalt—Carbonate	lb.	1.50
Nitrate	"	1.30
Oxide	"	1.76@1.85
Sulphate	"	.85
Copperas	100 lbs.	.57½
Copper—Acetate, com'l	lb.	.16@.20
Carbonate	"	.15@.16
Chloride	"	.25
Nitrate, crystals	"	.35
Oxide, black	"	.30
Ppt., pure	"	.50
Red	"	.40
Ppt., pure	"	1.25
Cream of Tarter—crys.	"	.23½@.23½
Granulated	"	.23½@.23½
Powdered	"	.23¾@.24
Cryolite	"	.08½
Explosives—		
Blasting powder, A	"	.08½
Blasting powder, B	"	.05@.05½
"Rackarock," A	"	.25
"Rackarock," B	"	.18
Judson R.R. powder, by carload	"	.10
Dynamite, (40% nitro-glycerine)	"	.15
(50% nitro-glycerine)	"	.17
(60% nitro-glycerine)	"	.19
(75% nitro-glycerine)	"	.23
Glycerine, for nitro (32 2-10° Be.)	"	.10½@.12
Nitro-Benzole	"	.14@.15
Feldspar—Ground	sh. ton	7.00@7.75
Flint—(See Silica).		
Fluorspar—Am. lump	"	7.00
Gravel	"	6.50
Crushed	"	6.00
Ground	"	11.00
Extra fine ground	"	12.50
Foreign, lump	"	8.00@12.00
Ground	"	11.50@14.00
Fuller's Earth—Lump	100 lbs.	.75
Powdered, in bags	"	.82½
Graphite—(See Plumbago).		
Gypsum—		
Am. gr'd (terra alba)	sh. ton	7.60
Fertilizer	"	4.50
Rock	lg. ton	4.00
English and French	"	14.00@16.00
Infusorial Earth—		
Ground, best qualities	"	20.00@.40.00
Iodine—Crude	100 lbs.	2.55
Resublimed	"	2.90@2.95
Iron—Chromate	lb.	.03@.10
Muriate	"	.05
Nitrate, com'l	"	.01@.01½
Pure	"	.03½@.04½
Oxide	"	.02@.12
Scale	"	.01@.03
Kaolin—(See Clay, China).		
Kanit	lg.ton	8.80@9.05
Kryolith—(See Cryolite.)		
Lead—Acetate		
White, broken	lb.	.06⅛
Com'l, broken	"	.05¾
White, gran	"	.07¾
Nitrate, com'l	"	.06½@.06¾
Chem. pure	"	.35
Lime—Bldg., ab. 250 lbs	bbl.	.65@.75
Finishing	lb.	.75@.80
Magnesite—		
Crude, lump 94%	sh. ton	8.00
Calcined, foreign	"	25.00
Domestic	"	16.00
Magnesium		
Metallic, ingots (Ger)	kg.	5.95@6.90
Powdered (Ger.)	"	6.19
Ribbon or wire (Ger.)	"	10.00
Carbonate	lb.	.10
Chloride, com'l	"	.01¾
Fused	"	.20
Nitrate	"	.60
Manganese—		
Crude, powdered, 70@75% binoxide	"	.01¼@.01½
75@85% binoxide	"	.01½@.02½
85@90% binoxide	"	.02½@.03¼
90@95% binoxide	"	.03¼@.05½
Carbonate	"	.16@.20
Chloride	"	.04
Ore, 50%	unit	.21@.22½
Sulphate, powdered	lb.	.25
Pure cryst	"	.40

	Cust. Meas.	Price.
Marble—Flour	sh. ton	8.08
Mercury—Bichloride	lb.	.59@.60
Bisulphate	"	.41
Mica—		
Ground	lb.	.04@.06
Sheets, according to size and quality	"	
Mineral Wool—F. o. b. Stanhope, N. J.:		
Slag, ordinary	100 lbs.	1.00
Selected	"	1.67
Extra	"	4.00
Rock, ordinary	sh. ton	37.00
Selected	100 lbs.	4.00
Extra	"	7.00
Monazite—92%	sh. ton	140.00
Nickel—		
Oxide, black No. 1	lb.	1.00
Black No. 2	"	.60
Green, No. 1	"	1.00
No. 2	"	.60
Oils—Black, reduced 29 gr., 25@30%	gal.	.07@.07½
Black reduced 29 gr. 15 cold test	"	.08@.08½
Black reduced 29 gr. zero	"	.11@.12
Black reduced summer	"	.06½@.07
Smith's Ferry, 33@34 gr.	"	.07½@.08½
West Virginia, 29 gr.	"	.22@.24
Cylinder, dark steam ref	"	.08@.13
Dark filtered	"	.11@.16
Light filtered	"	.13@.15½
Extra cold test	"	.21@.25
Gasoline, 86°	bbl.	13.00@14.00
88°	"	15.00@16.00
90°	"	18.00@19.00
Neutral filtered, lemon, 33@34 gr.	gal.	.13@.18½
White, 33@34 gr	"	.21@.23
Wool grade, 32 gr	"	.11@.14
Naphtha, crude, 68@72°	bbl.	5.50
70°	"	6.00
Paraffine, high viscosity	gal.	.20@.25
23½@24 gr	"	.09¼@.09¾
25 gr	"	.08¾@.08½
28@32 gr	"	.06¾@.07¼
Red No. 1	"	.08¾@.09¼
No. 2	"	.08¾@.08¾
Linseed, domestic raw	"	.37@.38
Boiled	"	.39@.40
Calcutta, raw	"	.54
Graphite, lubricating, Am. dry	lb.	.10
In oil	"	.12
Axle grease	"	.08½@.10
Wood grease	"	.05@.06
Ozokerite—Foreign	"	.06@.08
Paints and Colors—		
Benzine, Samatra	"	.35@.40
Marbled	"	.27@.28
Chrome green, common	"	.05@.06
Extra	"	.14½@.15
Yellow, common	"	.10
Best	"	.25
Silica Graphite, thick	"	.12
Thinned	gal.	1.15
Lampblack—Com'l	lb.	.03@.05
Refined	"	.08@.10
Calcined	"	.12@.20
Fine spirit	"	.20@.35
Litharge, Am. powd.	"	.04¾@.05¼
English flake	"	.07¾@.08
Metallic, brown	"	.05½
Red	"	18.00@20.00
Ocher, Am. best	sh. ton	15.00
Dutch, washed	lb.	.04¾@.05
French, washed	"	.01@.01¾
Orange mineral, Am	"	.07½@.08
Foreign, as to make	"	.08½@.10¾
Paris green, pure	"	.14½@.21½
Red lead, American	"	.05½@.06
Foreign	"	.07½@.08
Shellac, D. C.	"	.28@.30
Native	"	.16@.17
Turpentine, spirits	gal.	.30@.30½
Ultramarine, best	lb.	.25
Vermilion, Amer. lead	"	.14@.16
Quicksilver, bulk	"	.59
Chinese	"	.80@.90
English, imported	"	.70@.90
Artificial	"	.12@.20
White lead, Am., dry	"	.04½@.04¾
In oil	"	.05½@.06
English, in oil	"	.07¼@.08¼
Whiting, common	100 lbs.	.35@.40
Gilders	"	.45@.50
Zinc white, Am., ex dry	lb.	.03¾@.04½
Foreign, red seal, dry	"	.07¾@.08⅜
Green seal, dry	"	.08⅜@.08⅞
Pitch—Coal tar	gal.	.08
Plumbago—American, pulverized, f. o. b., Providence, R. I.	sh. ton	25.00@40.00
Lump	"	8.00
German, lump	100 lbs.	.95
Pulverized	lg. ton	16.50
Ceylon, crude	lb.	.01¼@.04½
Pulverized	"	.02@.05
Potash—		
Caustic	"	.04½@.06
Potassium—		
Metallic, in balls (Ger)	kg.	17.85
Bicarbonate cryst	lb.	.08½
Powdered or gran	"	.12
Bichromate	"	.09¾@.10
Bromide, bulk	"	.44@.45
Carbonate	"	.03@.04
Chromate	"	.35
Cyanide (98@99%)	"	.28
Double manure salts, 48@53% (basis 48%)	100 lbs.	1.03
Muriate, 80@85% (basis 80%)	"	1.78
Permanganate, pure cr.	lb.	.15¼@.15½
Chem. pure	"	.34

	Cust. Meas.	Price.
Potassium—Silicate	lb.	.06
Prussiate, yellow	"	.16@.17
Red	"	.37@.40
Sulphate, 90@95% (basis 90%)	100 lbs	1.99½
Sulphide, com'l	"	.10
Quartz—(See Silica).		
Rosin—Common	gal.	.10
Best	"	.16
Saltpeter—Crude	lb.	.03¾@.04
Double refined	"	.05@.06
Silica—		
Ground quartz	sh. ton	6.75@8.00
Best	"	12.00
Lump quartz	"	2.50@4.00
Silver—Chloride	oz.	.65
Nitrate	"	.41@.42¼
Oxide	"	.85@1.10
Slate—Flour	sh. ton	7.50
Sodium—Metallic	lb.	.75
Acetate, com'l	"	.08½
Chem. pure	"	.05½
Bichromate	"	.07¾@.08
Bisulphite, com'l	"	.01¼@.02¼
Bromide	"	.49@.50
Chlorate, com'l	"	.09¾@.10
Hyposulphite, com'l	100 lbs.	1.60
Nitrite	lb.	.07½@.07¾
Peroxide	"	.45
Silicate, Com'l	"	.01¼@.01½
Sulphate, gran., purified	"	.03
Tungstate, com'l	"	.35
Pure	"	.50
Strontium—Carb., ppt.	"	.13@.14
Nitrate	"	.07½@.07¾
Sulphur—Roll	100 lbs.	2.00
Flour	"	2.20@2.25
Talc—N. C No. 1	sh. ton	15.00@15.50
No. 2	"	10.00@12.00
N. Y., Fibrous	"	8.00@9.00
French, best	"	20.00
Italian, best	"	20.00
Tin—Chloride	lb.	.11@.13
Crystals	"	.14@.14¾
Muriate	"	.06@.08
Oxide, white, ch. pure	"	.30@.32
Uranium—Oxide	"	2.00@3.00
Zinc—Metallic, ch. pure	"	.06¾
Carbonate	"	.15
Chloride	"	.06
Dust	"	.06¾@.08
Sulphate	"	.02@.02¼

THE RARE ELEMENTS.

Prices given are at makers' works in Germany, unless otherwise noted.

	Cust. Meas.	Price.
Barium—Amalgam	grm.	$1.19
Electrol	"	5.71
Beryllium—Powder	"	5.95
Crystals	"	9.04
Nitrate (N. Y.)	oz.	2.50
Boron—Amorphous, pure	grm.	.19
Crystals, pure	"	1.43
Nitrate (N. Y.)	lb.	1.50
Calcium—Electrol	"	4.28
Cerium—Fused	grm.	2.02
Nitrate (N. Y.)	lb.	28.00
Chromium—Fused	kg.	5.95
Pure powder	"	1.79
Chem. pure cryst	grm.	.19
Cobalt—(98@99%)	kg.	5.35@5.71
Pure	"	30.94
Didymium—Powder	grm.	3.81
Nitrate (N. Y.)	oz.	4.00
Erbium	grm.	3.09
Nitrate (N. Y.)	oz.	3.00
Gallium	grain	9.52
Germanium—Powder	grm.	33.32
Fused	"	35.70
Glucinum—Powder	"	5.95
Crystals	"	9.04
Nitrate (N. Y.)	lb.	2.50
Indium	grm.	4.05
Iridium	"	1.19
Lanthanum—Powder	"	4.28
Electrol, in balls	"	9.04
Nitrate (N. Y.)	oz.	3.50
Lithium	grm.	2.38
Nitrate (N. Y.)	oz.	.60
Molybdenum—Powder	kg.	2.62
Fused, electrol	100 grms.	15.47
Niobium	grm.	3.81
Osmium	"	.95
Palladium	"	2.97
Rhodium	"	4.76
Rubidium—Pure	"	1.55
Ruthenium—Pure	"	26.18
Selenium—Com'l powder	kg	35.70
Sublimed powder	"	28.56
Sticks	"	2.87
Silicium—Amorphous	100 grms.	7.14
Crystals, pure	"	6.19
Strontium—Electrol	grm.	3.57
Tantalium—Pure	"	11.90
Tellurium—Ch. p. sticks	100 grms.	9.52
Powder	"	23.80
Thallium	kg.	7.85
Thorium—Metallic	grm.	7.50@8.00
Nitrate 49@50% (N. Y.)	lb.	.71
Titanium	grm.	.48
Uranium	"	.25
Nitrate (N. Y.)	oz.	1.19
Vanadium—Fused	grm.	22.80
Wolfram—Fused	100 grms.	2.38
Powder, 95@98%	kg.	7.14
Chem. pure	"	47.60
Ore, lump	"	42.84
Powdered	"	3.33
Yttrium	grm.	4.00
Nitrate (N. Y.)	oz.	119.00
Zirconium—Com'l	kg.	.71
Pure	grm.	1.00
Nitrate (N. Y.)	oz.	

MACHINERY FOR SALE.

FOR SALE.
CONCENTRATING MILL.

Adapted for copper, lead or zinc ores. capacity 30 to 50 tons per day, complete, new, first class, and in perfect running order, delivered on cars, cheap for cash, with or without the steam power plant. For specifications address P. K. MINING CO., Antelope, Idaho.

FOR SALE.—A Number of Second-Hand
Split Switches for 30-lb. Rail,

(3 ft. gauge of track), including 4 ft. Frog, Ground Lever, Switch Points and Connecting Rods. New and Relaying STEEL RAILS BOUGHT AND SOLD.

ROBINSON & ORR,
No. 419 Wood Street, Pittsburgh, Pa.

Valuable Bessemer Steel Plant and Steel Structural Rolling Mill
FOR SALE.

THE BESSEMER department is an iron building 64 by 280 and 30 feet to the eaves, with Stock Elevators; three Cupola Smelting Furnaces of two hundred (200) gross tons per turn of 12 hours; two five-ton Bessemer Convertors; Charging and Casting Cranes; Casting Pit; three improved vertical Soaking Pit Furnaces; Cranes for stripping and handling Ingots; Bloom Mill; Bloom Shear; Tracks and all necessary engines and hydraulic apparatus. Capacity one hundred and fifty (150) tons per turn of 12 hours.

THE STEEL STRUCTURAL ROLLING MILL in front of the Bessemer Plant is an iron building 110 by 320 feet, with extensions to either side for engines 30 by 50 feet, and consists of a 26-inch Mill and an 18-inch Mill cooling-beds, and all necessary engines, heating furnaces, hot saws with driven roller-tables, hydraulic automatic lifting tables, and other labor-saving machinery. Capacity of 26-inch Mill fifty (50) tons; capacity of 18-inch Mill twenty-five (25) tons per turn of 12 hours.

THE STOCK YARD in front of the mills and cooling-beds is fitted up with Cold Saws and their Engines; Punches; Shears; Skids; Tracks, &c., so arranged that material can be dropped into the cars with ease and the least amount of labor.

THE STEAM SUPPLY from a battery of 20 tubular boilers, set up in the most improved manner, the Bessemer Repair Shops and the hydraulic pumps, feed pumps, blowers and their engines, are inclosed in a separate iron building 40 by 318 feet.

The entire Plant is fitted up in the most complete manner, so that in every operation the material is placed ready for the next.

THE STEEL PLANT AND MILL contains twenty-eight (28) Steam Engines and twenty-two (22) hydraulic cylinders and machines for handling the material.

THE MILL was built to manufacture Steel Beams, Channels, Angles, Tees and special shapes for architectural and engineering purposes.

The property has direct connection with both the P. R. R. and B. & O. R. R., and has an entire system of switches extending around it.

Office building, Laboratory, Store and Stock Houses.

The Plant is at Uniontown, Fayette County, Penna., on fourteen acres of land, which is underlaid with the famous Connellsville Coking Coal.

For terms address:

THE SAFE DEPOSIT AND TRUST CO.,
247 Fourth Avenue, Pittsburgh, Pa.

FOR SALE.
KLONDIKERS, ATTENTION!

I have in storage at Pacific Coast port Light Draft New Stern Wheel River Steamboat, built knocked down, 29 ft. beam, 80 ft. in length; equipped complete with modern machinery; cost, $7,500. Also **URIE ELEVATOR MINING DREDGE**, 600 yards capacity, cost $4,500. Also Steam Saw Mill Outfit complete, cost $1,200; 8,000 ft. daily capacity. Above machinery can be bought at a **GREAT SACRIFICE** if sold at once. For further particulars address

W. J. BREWSTER, Director,
"Bonaventure Hotel," Kansas City, Mo.

LANDS AND MINES FOR SALE.

MISSOURI
Lead-Zinc Mines

Write for particulars and illustrated pamphlet of large dividend paying properties Address

E. HEDBURG & CO.,
Joplin, Mo., U. S. A.

NICKEL MATTE FOR SALE.

Also four extensive Nickel properties undeveloped. T. M. KIRKWOOD, Sudbury, Ontario, Canada.

BIG MONEY MADE. Canvassing Subscriptions for the ENGINEERING AND MINING JOURNAL.

$90,000.00

Paid in Dividends Within Three Months,

Such is the record of the Republic mine. In three months the stock advanced from $2 25 to $4.25, based on the value of ore in sight ($5,000,000), and we predict a further advancement.

JIM BLAINE ADJOINS

JIM BLAINE.	REPUBLIC.

The best purchase in the camp. Under the able management of Mr. Patrick Clark. Ample funds behind the company. In six months we predict dividends. Actual assets (in ore bodies) to sustain the value of the stock.

We also strongly recommend "Lone Pine," under the control of the Republic people. Average assays from entire ore bodies over $50.00 per ton.

We refer you to any banking house in this city as to the reliability of the gentlemen connected with these properties.

Responsible agents wanted to handle Republic stocks. Quotations furnished by wire upon application. Address

BRITISH-CANADIAN
Investment & Mining Syndicate,
SPOKANE, WASH.

$10,000 to $50,000 for Investment

in a legitimate Gold Mining Enterprise which will bear rigid investigation Propositions invited. Actual owners only need apply. Address GOLD, P. O. Box 1592, Philadelphia, Pa.

Received Too Late for Classification.

CHEMIST'S POSITION DESIRED IN A chemical laboratory by a young man of two years' practical experience therein Best of references given. Address W. T. BARTER, Stevens Institute, Hoboken, N. J No. 18,369, Dec. 24.

ASSAYER AND CHEMIST. GRADUATE of a Canadian School of Mines, and eight years' experience in assaying, mining and milling, desires position. Best of references At liberty January 1st, 1899. Address CANADIAN, ENGINEERING AND MINING JOURNAL. No. 18,370, Dec. 24.

Sulphuric Acid Plants; Five tons daily and up.
Pyrites Plants for Sulphite Pulp Manufacturers

PURE COOL } GAS CHEAP UNIFORM } GAS

F. J. FALDING, Chemical Engineer,
45 Broadway, New York.

SMUGGLER-UNION MINING CO.,
804 Boston Building, Denver Colo.
Mines at Telluride, San Miguel Co., Colorado.
DIRECTORS:
A. Porter, President; Richard Pearce, V.-Pres.
James B. Grant, A. Kilers, Wm. A. Bell,
Wm. D. Bishop, Jr.,
A. H. Fowler, Sec'y & Treas.

THE ENGINEERING AND MINING JOURNAL

Net Advertising Rates per Insertion for Various Size Cards. Run of Paper.

(NONPAREIL MEASUREMENT.)

	Lines.	Inches.	One time.	Two times.	Three times.	Four times.	13 times.	26 times.	52 times.
	6	½	$2.00	$1.75	$1.50	$1 25	$0.92	$0.77	$0 65
	9	¾				1.50	1.23	1.08	.90
	12	1	3.00	2.75	2.50	2.00	1.54	1.35	1.15
	15	1¼				2.25	1.85	1.61	1.40
	18	1½	4.00	3.50	3.25	2.75	2.23	1.92	1.67
	21	1¾				3 00	2.54	2.23	1.93
	24	2	5.00	4 25	4.00	3.50	2.92	2.54	2.17
	30	2½	6.00	5 25	4.50	4.25	3.54	3.04	2.64
¼ col..	33	2¾				4.75	3.85	3.31	2.87
	36	3	8.00	7.00	6.00	5.00	4 15	3.58	3.10
	42	3½	9 00	7 50	6.50	5.75	4.70	4.08	3 52
	48	4	10.00	8 00	7.00	6.25	5.23	4 54	3 92
	54	4½	11.00	9.00	8.00	7.00	5.77	5.00	4.31
	60	5	12.00	10.00	9.00	7.50	6.23	5.43	4.67
½ col..	66	5½	13.00	11.00	9.50	8.00	6.70	5 81	5.02
	72	6	14.00	12.00	10.00	8.75	7.15	6 20	5.36
	84	7	16.00	13 00	11.00	9.75	8.07	6.97	6 02
	96	8	17.50	15.00	13.25	10.75	8.84	7.70	6.65
1 p....	102	8½	18.00	15.50	13.50	11.25	9.3	8.04	7.00
	108	9	19.00	16.00	14.00	11.75	9.69	8.43	7.27
	120	10	20 50	17.00	15 00	12.75	10.53	9.16	7.90
½ p....	204	17	32.00	28.00	22.00	19.75	16.76	14.40	12.20
Full p..	408	34	61.00	50.00	42.50	36.75	31.30	27.15	23.46

SPECIAL POSITIONS.

Front page, double regular rates.

Back outside page and page facing editorials, 50 per cent. above regular rates.

Page facing market reports, 25 per cent. above rates.

SITUATIONS WANTED.—Ten cents per line, averaging 7 words.

HELP WANTED.—Advertisements are inserted free, in the interest of subscribers only.

EXTRA SPACE.

To encourage advertisers to use extra space for special announcements, the following advantage is offered:

All space used during any quarter in excess of contract will be charged to the advertiser at his regular contract rate, but at the expiration of contract he will be given the benefit of the lower rate allowed for the total number of inches used during the life of the contract.

TO PIGMENT AND DRY COLOR MANUFACTURERS.

OPEN TO ENGAGEMENT,

A Chemist, thoroughly familiar with the manufacture of pigments and dry colors **by the newest methods.** Chromium colors, paris green, ultramarine, etc.; Barium sulphate, chloride, carbonate, blanc fix, lytophon and zinc-baryte. Would join capitalist in establishing a new industry, which would require but a small amount of capital and would yield large profits. Highest references furnished. Address "CHEMICALS MANUFACTURER," ENGINEERING AND MINING JOURNAL.

Shaft Sinking Through Quicksands.

The cheapest and most rapid method ever applied for sinking shafts of any size to any depth through quicksands, or in any difficult ground, and for driving tunnels through clays or wet ground. SUCCESS GUARANTEED. Experienced workmen furnished or contracts taken.

C. C. LOVEJOY, care of ENGINEERING AND MINING JOURNAL,
253 Broadway, New York.

FRED. F. HUNT,

77 Pine St., New York,

ANALYST AND ASSAYER.

Weighing, Sampling and Assaying of Ores, Mattes, Lead Bullion and all Mineral Products.

Simonds & Wainwright,

Laboratories, 159 Front St., (cor. Maiden Lane, New York.

CHEMICAL AND MINING ENGINEERS AND ANALYSTS.

Assays, Analyses, Experimental Research and Consultation.

The Mineral Industry, Vol. VI.

"Our library is in possession of the entire set, and we find them of much service in answering inquiries touching the subjects treated therein."

TREASURY DEPARTMENT, Washington, D. C.

NICKEL

GRAIN—for Anodes, German-Silver and Steel.

THE CANADIAN COPPER CO.

Room 12 Wade Bldg., Cleveland, O.

LAMBERT'S WHARFAGE CO.,

Prince of Wales Dock, SWANSEA.

Ores, Mattes, Regulus and Bars Received and Prepared for Market.

Copper, Lead, Tin, Spelter and Pig Iron Received Weighed and Sampled and Warrants issued against same.

N. B.—Warrants are on the Accepted List of the London Metal Exchange.

Regular lines of Steamers from America, Europe, etc.

Consign Goods to Lambert's Cranes, Prince of Wales Dock, Swansea.

ROBERTSON & ZIEGLER,

27 THAMES ST., Cor. Greenwich St., NEW YORK,

Mining Engineers, Metallurgists and Assayers.

Ores, Mattes, Lead Bullion, and all Furnace Products Sampled and Assayed.

THE NICHOLS CHEMICAL COMPANY,

32 Liberty St., New York.

COPPER REFINERS.

Consignments of Ores, Mattes and Blister Copper solicited.

....MANUFACTURERS OF....

THE HERRESHOFF COPPER SMELTER.

THE HERRESHOFF ROASTING FURNACE.

DR. LUCIUS PITKIN

CHEMIST

ASSAYER

138 PEARL STREET, NEW YORK.

SAMPLING & WEIGHING

GOLD AND SILVER BEARING COPPER PRODUCTS A SPECIALTY.

UMPIRE ASSAYS.

THE AMERICAN METAL CO.

LIMITED.

Exchange Court Bldg., 52 Broadway, 10th Floor, NEW YORK. Security Building, ST. LOUIS, MO.

COPPER, COPPER ORES AND MATTES, TIN, LEAD, SPELTER, ANTIMONY, NICKEL, ALUMINUM.

ADVANCES MADE ON CONSIGNMENTS.

Agents for Henry R. Merton & Co., London, Birmingham Manchester and Glasgow; Metallgesellschaft, Frankfort-on Main; Williams, Foster & Co., Ltd., Swansea, Eng.; Societe le Nickel, Paris, France; Balbach Smelting & Refining Co., Newark, N. J.

The Orford Copper Co.

COPPER AND NICKEL.

Copper Ore, Matte or Bullion purchased. Advances made on consignments for refining and sale.

Specialty made of Silver-bearing Ores and Matte and Nickel Ores and Matte.

Sell INGOT AND CAKE COPPER and Wire Bars, Malleable Nickel, Shot, Plates, Ingots, Bars, Sheets, Wire. Best quality for Anodes, German Silver and Nickel-Steel.

President, ROBERT M. THOMPSON.

Office: 37 and 39 Wall Street, New York.

THE BRIDGEPORT COPPER CO.

BRIDGEPORT, CONN.

Refiners of Copper. . . .

. . . . Argentiferous Material treated on favorable terms.

Advances Made on Consignments . . .

THE ROESSLER & HASSLACHER CHEMICAL COMPANY — CHEMISTS — NEW YORK

CYANIDE

PEROXIDE OF SODIUM

And all other Mining Chemicals.

The Roessler & Hasslacher Chemical Co.,

100 WILLIAM ST., NEW YORK

CASE & WESTERVELT

100 William St. (cor. John St.), New York.

MINING ENGINEERS, METALLURGISTS and ASSAYERS.

Mining and Metallurgical Properties examined and valued, and work installed and managed.

Mineral and Commercial Sampling, Testing, Assays and Analyses. Consultation and Advice.

Telephone, No. 5326 Cortlandt.

Cable Address, CASEWEST, New York.

Telegraph Codes used, McNeill's and A. B. C., 4th ed.

LEDOUX & CO.

NEW YORK.

SAMPLE AND ASSAY ORES AND METALS.

Consignments Stored or Forwarded. Advances Obtained.

Laboratory and Office, 98 John Street.

☞ Independent Ore-Sampling Works at the Port of New York. Only two such on Atlantic Seaboard. ☜

RICKETTS & BANKS,

104 JOHN ST., NEW YORK.

ORES TESTED.

☞ Complete Ore Milling and Testing Works for making practical working tests of ores to determine the Best Method of Treatment. Milling, Metallurgical and Chemical Processes investigated.

ASSAYS AND ANALYSES.

Assayers by appointment to New York Metal Exchange.

JAMES & SHAKSPEARE,

ENGLAND.

1 Metal Exchange Buildings, London, E. C., AND 17 Irwell Chambers West, Liverpool, Eng.

METALS, MATTES AND MINERALS.

Cable Address, METALLURGY, LONDON.

Use A B C, Bedford McNeill, or Lieber's Code.

HENRY BATH & SON

London, Liverpool and Swansea,

BROKERS.

All Description of

Metals, Mattes, Etc.

Warehouses, Liverpool and Swansea.

Warrants Issued under their Special Act of Parliament.

NITRATE OF SODA.

Cable Address: - BATHOTA, LONDON.

VIVIAN, YOUNGER & BOND,

117 Leadenhall St., London, E. C.

Copper, Tin, Lead, Spelter, Antimony, Silver Bullion and all kinds of metals.

Best terms for Copper Mattes, Lead and Silve Ores, Silver-Lead Bullion, Etc., Etc.

Tinplates, Galvanized Iron, Railway Material, Etc., Etc.

Cable Address: "BOND," London.

Telegraph Codes Used: Bedford McNeill's A B C 4th Edition, Moreing & Neal's.

LEWISOHN BROTHERS,

P. O. Box 1247. 81 and 83 FULTON STREET, NEW YORK.

Advances made on Copper, Matte and Ores.

Agents for the following Mining Companies: Boston & Montana C. C. & S. Mining Co. Old Dominion Copper Mining & Smelting Co.; Arizona Copper Co., Ltd.; Tamarack Mining Co.; Osceola Consolidated Mining Co.; Butte & Boston Mining Co.; Kearsarge Mining Co.; Tamarack Junior Mining Co.

BALTIMORE COPPER SMELTING AND ROLLING COMPANY

(The Baltimore Copper Works)

Office: KEYSER BUILDING, BALTIMORE, MD.

Ingot Copper. Sheet Copper

Diamond Pointed Core Drills

Take out SOLID core to any required depth. Unequaled for Accuracy, Durability, Efficiency and Economy. For twenty-six years these drills have led all competitors, and embody many new and VALUABLE improvements not possessed by other drills.

They are the *ONLY MACHINES* that will indicate *INSTANTLY* and *ACCURATELY* the *EXACT THICKNESS* of *EACH* and *EVERY STRATUM OF ROCK* while the drill is running, thus enabling the operator to save a much *GREATER PERCENTAGE OF CORE* than can be saved by any other drill. They are the only machines capable of giving a *RELIABLE* record of the *THICKNESS* of *EVERY STRATUM PASSED* through in boring. We carry *IN STOCK* drills of *VARIOUS SIZES* capable of boring holes from *200* to *5,000 FEET* in depth. Before contracting or purchasing send for catalogue and terms for drilling holes by contract. *We also build a large line of Mining, Hoisting and Underground Haulage Machinery.*

Write for what you want to

THE M. C. BULLOCK MAN'F'G CO., 1170 Lake St., CHICAGO, U. S. A.